101 S.Ct. 2478
Supreme Court of the United States

AMERICAN TEXTILE MANUFACTURERS INSTITUTE, INC., et al., Petitioners,
v.
Raymond J. DONOVAN, Secretary of Labor, United States Department of Labor, et al.
NATIONAL COTTON COUNCIL OF AMERICA, Petitioner,
v.
Raymond J. DONOVAN, Secretary of Labor, United States Department of Labor, et al.

Nos. 79-1429, 79-1583.
|
Argued Jan. 21, 1981.
|
Decided June 17, 1981.

Synopsis

Representatives of the cotton industry brought suit challenging the validity of cotton dust standard promulgated by the Secretary of Labor, acting through the Occupational Safety and Health Administration. The Court of Appeals, 199 U.S.App.D.C. 54, 617 F.2d 636, upheld the standard in all major respects, and certiorari was granted. The Supreme Court, Justice Brennan, held that: (1) the Secretary, in promulgating standards dealing with toxic materials or harmful physical agents under provision of the Occupational Safety and Health Act which requires the Secretary to set the standard "which most adequately assures, to the extent feasible, on the basis of the best available evidence" that no employee will suffer material impairment of health, is not required to determine that the costs of the standard bear a reasonable relationship to its benefits; cost-benefit analysis by OSHA is not required by the statute because feasibility analysis is; (2) Court of Appeals, on the basis of the whole record, did not misapprehend or grossly misapply the substantial evidence test when it upheld OSHA's findings; and (3) whether or not OSHA had the underlying authority to promulgate a wage guarantee requirement with respect to employees transferred to another position when they are unable to wear a respirator, OSHA failed to make the necessary determination or statement of reasons that such requirement was related to achievement of health and safety goals.

Affirmed in part, vacated in part, and remanded.

Justice Stewart filed a dissenting opinion.

Justice Rehnquist filed a dissenting opinion in which Chief Justice Burger joined.

Justice Powell took no part in the decision.

****2481 *490** *Syllabus* [*]

Section 6(b)(5) of the Occupational Safety and Health Act of 1970 (Act) requires the Secretary of Labor (Secretary), in promulgating occupational safety and health standards dealing with toxic materials or harmful physical agents, to set the standard "which most adequately assures, to the extent feasible, on the basis of the best available evidence" that no employee will suffer material impairment of health. Section 3(8) of the Act defines the term "occupational safety and

health standard" as meaning a standard which requires conditions, or the adoption or use of practices, means, methods, operations, or processes, "reasonably necessary or appropriate" to provide safe or healthful employment and places of employment. Section 6(f) of the Act provides that the Secretary's determinations "shall be conclusive if supported by substantial evidence in the record considered as a whole." The Secretary, acting through the Occupational Safety and Health Administration (OSHA), promulgated the so-called Cotton Dust Standard limiting occupational exposure to cotton dust (an airborne particle byproduct of the preparation and manufacture of cotton products), exposure to which induces byssinosis, a serious and potentially disabling respiratory disease known in its more severe manifestations as "brown lung" disease. Estimates indicate that at least 35,000 employed and retired cotton mill workers, or 1 in 12, suffers from the most disabling form of byssinosis, and 100,000 employed and retired workers suffer from some form of the disease. The Standard sets permissible exposure levels to cotton dust for the different operations in the cotton industry. Implementation of the Standard depends primarily on a mix of engineering controls, such as installation of ventilation systems, and work practice controls, such as special floor-sweeping procedures. During the 4-year interim period permitted for full compliance with the Standard, employers are required to provide respirators to employees and to transfer employees ***491** unable to wear respirators to another position, if available, having a dust level that meets the Standard's permissible exposure limit, with no loss of earnings or other employment rights or benefits. OSHA estimated the total industrywide cost of compliance as $656.5 million. Petitioners, representing the cotton industry, challenged the validity of the Standard in the Court of Appeals, contending, *inter alia*, that the Act requires OSHA to demonstrate that the Standard reflects a reasonable relationship between the costs and benefits associated with the Standard, that OSHA's determination of the Standard's "economic feasibility" was not supported by substantial evidence, and that the wage guarantee requirement was beyond OSHA's authority. The Court of Appeals upheld the Standard in all major respects. It held that the Act did not require OSHA to compare costs and benefits; that Congress itself balanced the costs and benefits in its mandate to OSHA under § 6(b)(5) to adopt the most protective feasible standard; and that OSHA's determination of economic feasibility was supported by substantial evidence in the record as a whole. The court also held that OSHA had authority to require employers to guarantee employees' wage and employment benefits following transfer because of inability to wear a respirator.

Held:

1. Cost-benefit analysis by OSHA in promulgating a standard under § 6(b)(5) is not required by the Act because feasibility analysis is. Pp. 2489-2497.

(a) The plain meaning of the word "feasible" is "capable of being done," and thus § 6(b)(5) directs the Secretary to issue the standard that most adequately assures that no employee will suffer material impairment of health, limited only by the extent to which this is "capable of being done." In effect then, as the Court of ****2482** Appeals held, Congress *itself* defined the basic relationship between costs and benefits by placing the "benefit" of the worker's health above all other considerations save those making attainment of this "benefit" unachievable. Any standard based on a balancing of costs and benefits by the Secretary that strikes a different balance than that struck by Congress would be inconsistent with the command set forth in § 6(b)(5). Pp. 2490-2492.

(b) Section 3(8), either alone or in tandem with § 6(b)(5), does not incorporate a cost-benefit requirement for standards dealing with toxic materials or harmful physical agents. Even if the phrase "reasonably necessary or appropriate" in § 3(8) might be construed to contemplate some balancing of costs and benefits, Congress specifically chose in § 6(b)(5) to impose separate and additional requirements for issuance of standards dealing with such materials and agents: it required that those standards be issued to prevent material health impairment ***492** *to the extent feasible*. To interpret § 3(8) as imposing an additional and overriding cost-benefit analysis requirement on the issuance of § 6(b)(5) standards would eviscerate § 6(b)(5)' s "to the extent feasible" requirement. P. 2492.

(c) The Act's legislative history supports the conclusion that Congress itself in § 6(b)(5) balanced the costs and benefits. There is no indication whatsoever that Congress intended OSHA to conduct its own cost-benefit analysis before

promulgating a toxic-material or harmful-physical-agent standard. Rather, not only does the history confirm that Congress meant "feasible" rather than "cost-benefit" when it used the former term, but it also shows that Congress understood that the Act would create substantial costs for employers, yet intended to impose such costs when necessary to create a safe and healthful working environment. Pp. 2493-2497.

2. Whether or not in the first instance this Court would find OSHA's findings supported by substantial evidence, it cannot be said that the Court of Appeals on the basis of the whole record "misapprehended or grossly misapplied" the substantial-evidence test when it upheld such findings. Pp. 2497-2504.

3. Whether or not OSHA has the underlying authority to promulgate a wage guarantee requirement with respect to employees who are transferred to another position when they are unable to wear a respirator, OSHA failed to make the necessary determination or statement of reasons that this requirement was related to achievement of health and safety goals. Pp. 2504-2506.

199 U.S.App.D.C. 54, 617 F.2d 636, affirmed in part, vacated in part, and remanded.

Attorneys and Law Firms

Robert H. Bork, New Haven, Conn., for petitioners.

Kenneth S. Geller, Washington, D.C., for respondent Marshall.

George H. Cohen, Washington, D.C., for respondent unions.

Opinion

***493** Justice BRENNAN delivered the opinion of the Court.

Congress enacted the Occupational Safety and Health Act of 1970 (Act) "to assure so far as possible every working man and woman in the Nation safe and healthful working conditions...." § 2(b), 84 Stat. 1590, 29 U.S.C. § 651(b). The Act authorizes the Secretary of Labor to establish, after notice and opportunity to comment, mandatory nationwide standards governing health and safety in the workplace. 29 U.S.C. §§ 655(a), (b). In 1978, the Secretary, acting through the Occupational Safety and Health Administration ***494** (OSHA), [1] promulgated a standard limiting occupational ****2483** exposure to cotton dust, an airborne particle byproduct of the preparation and manufacture of cotton products, exposure to which induces a "constellation of respiratory effects" known as "byssinosis." 43 Fed.Reg. 27352, col. 3 (1978). This disease was one of the expressly recognized health hazards that led to passage of the Act. S.Rep.No.91-1282, p. 3 (1970), U.S.Code Cong. & Admin.News 1970, p. 5177, Legislative History of the Occupational Safety and Health Act of 1970, p. 143 (Comm. Print 1971) (Leg.Hist.).

Petitioners in these consolidated cases, representing the interests of the cotton industry, [2] challenged the validity of the "Cotton Dust Standard" in the Court of Appeals for the District of Columbia Circuit pursuant to § 6(f) of the Act, 29 U.S.C. § 655(f). They contend in this Court, as they did below, that the Act requires OSHA to demonstrate that its Standard reflects a reasonable relationship between the costs and benefits associated with the Standard. Respondents, the Secretary of Labor and two labor organizations, [3] counter that Congress balanced the costs and benefits in the Act itself, and that the Act should therefore be construed not to require ***495** OSHA to do so. They interpret the Act as mandating that OSHA enact the most protective standard possible to eliminate a significant risk of material health impairment, subject to the constraints of economic and technological feasibility. The Court of Appeals held that the Act did not require OSHA to compare costs and benefits. *AFL-CIO v. Marshall*, 199 U.S.App.D.C. 54, 617 F.2d 636 (1979). We granted certiorari, 449 U.S. 817, 101 S.Ct. 68, 66 L.Ed.2d 19 (1980), to resolve this important question, which was

presented but not decided in last Term's *Industrial Union Dept. v. American Petroleum Institute*, 448 U.S. 607, 100 S.Ct. 2844, 65 L.Ed.2d 1010 (1980), [4] and to decide other issues related to the Cotton Dust Standard. [5]

I

Byssinosis, known in its more severe manifestations as "brown lung" disease, is a serious and potentially disabling respiratory disease primarily caused by the inhalation of cotton dust. [6] See **2484 43 Fed.Reg. 27352-27354 (1978); Exhibit *496 6-16, App. 15-22. [7] Byssinosis is a "continuum ... disease," 43 Fed.Reg. 27354, col. 2 (1978), that has been categorized into four grades. [8] In its least serious form, byssinosis produces both subjective symptoms, such as chest tightness, shortness of breath, coughing, and wheezing, and objective indications of loss of pulmonary functions. *Id.*, at 27352, col. 2. In its most serious form, byssinosis is a chronic and irreversible obstructive pulmonary disease, clinically similar to chronic bronchitis or emphysema, and can be severely disabling. *Ibid.* At worst, as is true of other respiratory diseases including bronchitis, emphysema, and asthma, byssinosis can create an additional strain on cardiovascular functions and can contribute to death from heart failure. See Exhibit 6-73, App. 72 ("there is an association between mortality and the extent of dust exposure"). One authority has described the increasing seriousness of byssinosis as follows:

> "In the first few years of exposure [to cotton dust], symptoms occur on Monday, or other days after absence *497 from the work environment; later, symptoms occur on other days of the week; and eventually, symptoms are continuous, even in the absence of dust exposure." A. Bouhuys, Byssinosis in the United States, Exhibit 6-16, App. 15. [9]

While there is some uncertainty over the manner in which the disease progresses from its least serious to its disabling grades, it is likely that prolonged exposure contributes to the progression. 43 Fed.Reg. 27354, cols. 1 and 2 (1978); Exhibit *498 6-27, App. 25; Exhibit 11, App. 152. It also appears that a worker may suddenly contract a severe **2485 grade without experiencing milder grades of the disease. Exhibit 41, App. 192. [10]

Estimates indicate that at least 35,000 employed and retired cotton mill workers, or 1 in 12 such workers, suffer from the most disabling form of byssinosis. [11] 43 Fed.Reg. 27353, col. 3 (1978); Exhibit 124, App. 347. The Senate Report accompanying the Act cited estimates that 100,000 active and retired workers suffer from some grade of the disease. S.Rep.No.91-1282, p. 3 (1970), Leg.Hist. 143. One study found that over 25% of a sample of active cotton-preparation and yarn-manufacturing workers suffer at least some form of the disease at a dust exposure level common prior to adoption of the current Standard. 43 Fed.Reg. 27355, col. 3 (1978); Exhibit 6-51, App. 44. [12] Other studies confirm these general findings on the prevalence of byssinosis. See, *e. g.*, Ct. of App.J.A. 3683; Ex. 6-56, *id.*, at 376-385.

Not until the early 1960's was byssinosis recognized in the United States as a distinct occupational hazard associated with cotton mills. S.Rep.No.91-1282, *supra*, at 3, Leg. *499 Hist. 143. [13] In 1966, the American Conference of Governmental Industrial Hygienists (ACGIH), a private organization, recommended that exposure to total cotton dust [14] be limited to a "threshold limit value" of 1,000 micrograms per cubic meter of air (1000 ug/m ^{3}) averaged over an 8-hour workday. See 43 Fed.Reg. 27351, col. 1 (1978). The United States Government first regulated exposure to cotton dust in 1968, when the Secretary of Labor, pursuant to the Walsh-Healey Act, 41 U.S.C. § 35(e), promulgated airborne contaminant threshold limit values, applicable to public contractors, that included the 1,000 ug/m ^{3} limit for total cotton dust. 34 Fed.Reg. 7953 (1969). [15] Following passage of the Act in 1970, the 1,000 ug/m ^{3} standard was adopted as an "established Federal standard" under § 6(a) of the Act, 84 Stat. 1593, 29 U.S.C. § 655(a), a provision designed to guarantee immediate protection of workers for the period between enactment of the statute and promulgation of permanent standards. [16]

In 1974, ACGIH, adopting a new measurement unit of respirable rather than total dust, lowered its previous exposure ***500** limit ****2486** recommendation to 200 ug/m ^{3} measured by a vertical elutriator, a device that measures cotton dust particles 15 microns or less in diameter. 43 Fed.Reg. 27351, col. 1, 27355, col. 2 (1978). [17] That same year, the Director of the National Institute for Occupational Safety and Health (NIOSH), [18] pursuant to the Act, 29 U.S.C. §§ 669(a)(3), 671(d)(2), submitted to the Secretary of Labor a recommendation for a cotton dust standard with a permissible exposure limit (PEL) that "should be set at the lowest level feasible, but in no case at an environmental concentration as high as 0.2 mg lint-free cotton dust/cu m," or 200 ug/m ^{3} of lint-free respirable dust. [19] Ex. 1, Ct. of App.J.A. 11; 41 Fed.Reg. 56500, col. 1 (1976). Several months later, OSHA published an Advance Notice of Proposed Rulemaking, 39 Fed.Reg. 44769 (1974), requesting comments from interested parties on the NIOSH recommendation and other related matters. Soon thereafter, the Textile Worker's Union ***501** of America, joined by the North Carolina Public Interest Research Group, petitioned the Secretary, urging a more stringent PEL of 100 ug/m ^{3}.

On December 28, 1976, OSHA published a proposal to replace the existing federal standard on cotton dust with a new permanent standard, pursuant to § 6(b)(5) of the Act, 29 U.S.C. § 655(b)(5). 41 Fed.Reg. 56498. The proposed standard contained a PEL of 200 ug/m ^{3} of vertical elutriated lint-free respirable cotton dust for all segments of the cotton industry. *Ibid.* It also suggested an implementation strategy for achieving the PEL that relied on respirators for the short term and engineering controls for the long term. *Id.*, at 56506, cols. 2 and 3. OSHA invited interested parties to submit written comments within a 90-day period. [20]

Following the comment period, OSHA conducted three hearings in Washington, D. C., Greenville, Miss., and Lubbock, Tex., that lasted over 14 days. Public participation was widespread, involving representatives from industry and the work force, scientists, economists, industrial hygienists, and many others. By the time the informal rulemaking procedure had terminated, OSHA had received 263 comments and 109 notices of intent to appear at the hearings. 43 Fed.Reg. 27351, col. 2 (1978). The voluminous record, composed of a transcript of written and oral testimony, exhibits, and post-hearing comments and briefs, totaled some 105,000 pages. 199 U.S.App.D.C., at 65, 617 F.2d, at 647. OSHA issued its final Cotton Dust Standard-the one challenged in the instant case-on June 23, 1978. Along with an accompanying statement of findings and reasons, the Standard occupied 69 pages of the Federal Register. 43 Fed.Reg. 27350-27418 (1978); see 29 CFR § 1910.1043 (1980).

****2487** The Cotton Dust Standard promulgated by OSHA establishesmandatory ***502** PEL's over an 8-hour period of 200 ug/m ^{3} for yarn manufacturing, [21] 750 ug/m ^{3} for slashing and weaving operations, and 500 ug/m ^{3} for all other processes in the cotton industry. [22] 29 CFR § 1910.1043(c) (1980). These levels represent a relaxation of the proposed PEL of 200 ug/m ^{3} for all segments of the cotton industry.

OSHA chose an implementation strategy for the Standard that depended primarily on a mix of engineering controls, such as installation of ventilation systems, [23] and work practice controls, such as special floor-sweeping procedures. Full compliance with the PEL's is required within four years, except to the extent that employers can establish that the engineering and work practice controls are infeasible. § 1910.1043(e)(1). During this compliance period, and at certain other ***503** times, the Standard requires employers to provide respirators to employees. § 1910.1043(f). Other requirements include monitoring of cotton dust exposure, medical surveillance of all employees, annual medical examinations, employee education and training programs, and the posting of warning signs. A specific provision also under challenge in the instant case requires employers to transfer employees unable to wear respirators to another position, if available, having a dust level at or below the Standard's PEL's, with "no loss of earnings or other employment rights or benefits as a result of the transfer." § 1910.1043(f)(2)(v).

On the basis of the evidence in the record as a whole, the Secretary determined that exposure to cotton dust represents a "significant health hazard to employees." 43 Fed.Reg. 27350, col. 1 (1978), and that "the prevalence of byssinosis should be significantly reduced" by the adoption of the Standard's PEL's, *id.*, at 27359, col. 3. In assessing the health risks from cotton dust and the risk reduction obtained from lowered exposure, OSHA relied particularly on data showing a strong linear relationship between the prevalence of byssinosis and the concentration of lint-free respirable cotton dust. *Id.*, at 27355-27359; Exhibit 6-51, App. 29-55. See also Ex. 6-17, Ct. of App.J.A. 235-245; Ex. 38D, *id.*, at 1492-1839. Even at the 200 ug/m ^{3} PEL, OSHA found that the prevalence of at least Grade ½ byssinosis would be 13% of all employees in the yarn manufacturing sector. 43 Fed.Reg. 27359, cols. 2 and 3 (1978).

In promulgating the Cotton Dust Standard, OSHA interpreted the Act to require adoption of the most stringent standard to protect against material health impairment, bounded only by technological and economic feasibility. *Id.*, at 27361, col. 3. OSHA therefore rejected the industry's alternative proposal for a PEl of 500 ug/m ^{3} in yarn ****2488** manufacturing, a proposal which would produce a 25% prevalence of at least Grade ½ byssinosis. The agency expressly found the Standard to be both technologically and economically feasible ***504** based on the evidence in the record as a whole. Although recognizing that permitted levels of exposure to cotton dust would still cause some byssinosis, OSHA nevertheless rejected the union proposal for a 100 ug/m ^{3} PEL because it was not within the "technological capabilities of the industry." *Id.*, at 27359-27360. Similarly, OSHA set PEL's for some segments of the cotton industry at 500 ug/m ^{3} in part because of limitations of technological feasibility. *Id.*, at 27361, col. 3. Finally, the Secretary found that "engineering dust controls in weaving may not be feasible even with massive expenditures by the industry,"*id.*, at 27360, col. 2, and for that and other reasons adopted a less stringent PEL of 750 ug/m ^{3} for weaving and slashing.

The Court of Appeals upheld the Standard in all major respects. [24] The court rejected the industry's claim that OSHA failed to consider its proposed alternative or give sufficient reasons for failing to adopt it. 199 U.S.App.D.C., at 70-72, 617 F.2d, at 652-654. The court also held that the Standard was "reasonably necessary and appropriate" within the meaning of § 3(8) of the Act, 29 U.S.C. § 652(8), because of the risk of material health impairment caused by exposure to cotton dust. 199 U.S.App.D.C., at 72-73, and n. 83, 617 F.2d, at 654-655, and n. 83. Rejecting the industry position that OSHA must demonstrate that the benefits of the Standard are proportionate to its costs, the court instead agreed with OSHA's interpretation that the Standard must protect employees against material health impairment subject only to the limits of technological and economic feasibility. *Id.*, at 80-84, 617 F.2d, at 662-666. The court held that "Congress itself struck the balance between costs and ***505** benefits in the mandate to the agency" under § 6(b)(5) of the Act, 29 U.S.C. § 655(b)(5), and that OSHA is powerless to circumvent that judgment by adopting less than the most protective feasible standard. 199 U.S.App.D.C., at 81, 617 F.2d, at 663. Finally, the court held that the agency's determination of technological and economic feasibility was supported by substantial evidence in the record as a whole. *Id.*, at 73-80, 617 F.2d, at 655-662.

We affirm in part, and vacate in part. [25]

***506 **2489** II

[1] The principal question presented in these cases is whether the Occupational Safety and Health Act requires the Secretary, in promulgating a standard pursuant to § 6(b)(5) of the Act, 29 U.S.C. § 655(b)(5), to determine that the costs of the standard bear a reasonable relationship to its benefits. Relying on §§ 6(b)(5) and 3(8) of the Act, 29 U.S.C. §§ 655(b)(5) and 652(8), petitioners urge not only that OSHA must show that a standard addresses a significant risk of material health impairment, see *Industrial Union Dept. v. American Petroleum Institute*, 448 U.S., at 639, 100 S.Ct., at 2863 (plurality opinion), but also that OSHA must demonstrate that the reduction in risk of material health impairment is significant in light of the costs of attaining that reduction. See Brief for Petitioners in No. 79-1429, pp. 38-41. [26] Respondents ***507** on

the other hand contend that the Act requires OSHA to promulgate standards that eliminate or reduce such risks "to the extent such protection is technologically and economically feasible." Brief for Federal Respondent 38; Brief for Union Respondents 26-27. [27] To **2490 resolve this debate, we must *508 turn to the language, structure, and legislative history of the Act.

A

The starting point of our analysis is the language of the statute itself. *Steadman v. SEC*, 450 U.S. 91, 97, 101 S.Ct. 999, 1005, 67 L.Ed.2d 69 (1981); *Reiter v. Sonotone Corp.*, 442 U.S. 330, 337, 99 S.Ct. 2326, 2330, 60 L.Ed.2d 931 (1979). Section 6(b)(5) of the Act, 29 U.S.C. § 655(b)(5) (emphasis added), provides:

> "The Secretary, in promulgating standards dealing with toxic materials or harmful physical agents under this subsection, shall set the standard which most adequately assures, *to the extent feasible*, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life." [28]

Although their interpretations differ, all parties agree that the phrase "to the extent feasible" contains the critical language in § 6(b)(5) for purposes of these cases.

[2] [3] The plain meaning of the word "feasible" supports respondents' interpretation of the statute. According to Webster's Third New International Dictionary of the English Language 831 (1976), "feasible" means "capable of being *509 done, executed, or effected." Accord, The Oxford English Dictionary 116 (1933) ("Capable of being done, accomplished or carried out"); Funk & Wagnalls New "Standard" Dictionary of the English Language 903 (1957) ("That may be done, performed or effected"). Thus, § 6(b)(5) directs the Secretary to issue the standard that "most adequately assures ... that no employee will suffer material impairment of health," limited only by the extent to which this is "capable of being done." In effect then, as the Court of Appeals held, Congress itself defined the basic relationship between costs and benefits, by placing the "benefit" of worker health above all other considerations save those making attainment of this "benefit" unachievable. Any standard based on a balancing of costs and benefits by the Secretary that strikes a different balance than that struck by Congress would be inconsistent with the command set forth in § 6(b)(5). Thus, cost-benefit analysis by OSHA is not required by the statute because feasibility analysis is. [29] See *Industrial Union Dept. v.* **2491 *American Petroleum Institute*, 448 U.S., at 718-719, 100 S.Ct., at 2902-2903 (MARSHALL, J., dissenting).

*510 [4] When Congress has intended that an agency engage in cost-benefit analysis, it has clearly indicated such intent on the face of the statute. One early example is the Flood Control Act of 1936, 33 U.S.C. § 701a:

> "[T]he Federal Government should improve or participate in the improvement of navigable waters or their tributaries, including watersheds thereof, for flood-control purposes if the *benefits to whomsoever they may accrue are in excess of the estimated costs*, and if the lives and social security of people are otherwise adversely affected." (Emphasis added.)

A more recent example is the Outer Continental Shelf Lands Act Amendments of 1978, 43 U.S.C. § 1347(b) (1976 ed., Supp.III), providing that offshore drilling operations shall use

> "the best available and safest technologies which the Secretary determines to be economically *feasible*, wherever failure of equipment would have significant effect on safety, health, or the environment, except where the Secretary determines that the *incremental benefits are clearly insufficient to justify the incremental costs of using such technologies*."

These and other statutes [30] demonstrate that Congress uses ***511** specific language when intending that an agency engage in cost-benefit analysis. See *Industrial Union* ****2492** *Dept. v. American Petroleum Institute, supra*, at 710, n. 27, 100 S.Ct., at 2898, n. 27 (MARSHALL, J., dissenting). Certainly in light of its ordinary meaning, the word "feasible" cannot be construed to articulate such congressional ***512** intent. We therefore reject the argument that Congress required cost-benefit analysis in § 6(b)(5).

B

[5] Even though the plain language of § 6(b)(5) supports this construction, we must still decide whether § 3(8), the general definition of an occupational safety and health standard, either alone or in tandem with § 6(b)(5), incorporates a cost-benefit requirement for standards dealing with toxic materials or harmful physical agents. Section 3(8) of the Act, 29 U.S.C. § 652(8) (emphasis added), provides:

> "The term 'occupational safety and health standard' means a standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, *reasonably necessary or appropriate* to provide safe or healthful employment and places of employment."

Taken alone, the phrase "reasonably necessary or appropriate" might be construed to contemplate some balancing of the costs and benefits of a standard. Petitioners urge that, so construed, § 3(8) engrafts a cost-benefit analysis requirement on the issuance of § 6(b)(5) standards, even if § 6(b)(5) itself does not authorize such analysis. We need not decide whether § 3(8), standing alone, would contemplate some form of cost-benefit analysis. For even if it does, Congress specifically chose in § 6(b)(5) to impose separate and additional requirements for issuance of a subcategory of occupational safety and health standards dealing with toxic materials and harmful physical agents: it required that those standards be issued to prevent material impairment of health *to the extent feasible*. Congress could reasonably have concluded that *health* standards should be subject to different criteria than *safety* standards because of the special problems presented in regulating them. See *Industrial Union Dept. v. American Petroleum Institute*, 448 U.S., at 649, n.54, 100 S.Ct., at 2867, n.54 (plurality opinion).

[6] ***513** Agreement with petitioners' argument that § 3(8) imposes an additional and overriding requirement of cost-benefit analysis on the issuance of § 6(b)(5) standards would eviscerate the "to the extent feasible" requirement. Standards would inevitably be set at the level indicated by cost-benefit analysis, and not at the level specified by § 6(b)(5). For example, if cost-benefit analysis indicated a protective standard of 1,000 ug/m ^{3} PEL, while feasibility analysis indicated a 500 ug/m ^{3} PEL, the agency would be forced by the cost-benefit requirement to choose the less stringent point. [31] We cannot believe that Congress intended the general terms of § 3(8) to countermand the specific feasibility requirement of § 6(b)(5). Adoption of petitioners' interpretation would effectively write § 6(b)(5) out of the Act. We decline to render Congress' decision to include a feasibility requirement nugatory, thereby offending the well-settled rule that all parts of a statute, if possible, are to be given effect. *E. g., Reiter v. Sonotone Corp.*, 442 U.S., at 339, 99 S.Ct., at 2331; *Weinberger v. Hynson, Westcott & Dunning, Inc.*, 412 U.S. 609, 633-634, 93 S.Ct. 2469, 2485, 3 L.Ed.2d 207 (1973); *Jarecki v. G. D. Searle & Co.*, 367 U.S. 303, 307-308, 81 S.Ct. 1579, 1582, 6 L.Ed.2d 859 (1961). Congress did not contemplate any further balancing by the agency for toxic material and harmful physical agents standards, and we should not " 'impute to Congress a purpose to paralyze with one hand what it sought to promote with the other.' " *Weinberger v.* ****2493** *Hynson, Westcott & Dunning, Inc., supra*, at 631, 93 S.Ct., at 2484, quoting *Clark v. Uebersee Finanz-Korporation*, 332 U.S. 480, 489, 68 S.Ct. 174, 178, 92 L.Ed. 88 (1947). [32]

***514** C

[7] The legislative history of the Act, while concededly not crystal clear, provides general support for respondents' interpretation of the Act. The congressional Reports and debates certainly confirm that Congress meant "feasible" and nothing else in using that term. Congress was concerned that the Act might be thought to require achievement of absolute safety, an impossible standard, and therefore insisted that health and safety goals be capable of economic and technological accomplishment. Perhaps most telling is the absence of any indication whatsoever that Congress intended OSHA to conduct its own cost-benefit analysis before promulgating a toxic material or harmful physical agent standard. The legislative history demonstrates conclusively that Congress was fully aware that the Act would impose real and substantial costs of compliance on industry, and believed that such costs were part of the cost of doing business. We thus turn to the relevant portions of the legislative history.

Neither the original Senate bill, S. 2193, 91st Cong., 1st Sess. (1969), introduced by Senator Williams, nor the original House bill, H.R. 16785, 91st Cong., 2d Sess. (1970), introduced by Representative Daniels, included specific provisions ***515** controlling the issuance of standards governing toxic materials and harmful physical agents, Leg.Hist. 1, 6-7 (Williams bill); 721, 728-732 (Daniels bill), although both contained the definitional section enacted as § 3(8).[33] The House Committee on Education and Labor, to which the Daniels bill was referred, reported out an amended bill that included the following section:

> "The Secretary, in promulgating standards under this subsection, shall set the standard which most adequately assures, on the basis of the best available professional evidence, that no employee will suffer any impairment of health or functional capacity, or diminished life expectancy even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life." H.R.Rep. No. 91-1291, p. 4 (1970) (to accompany H.R. 16785), Leg.Hist. 834.

The Senate Committee on Labor and Public Welfare, reporting on the Williams bill, included a provision virtually identical to the House version, except for the additional requirement that the Secretary set the standard "which most adequately *and feasibly assures* ... that no employee will suffer any impairment of health." *Id.*, at 242 (the Senate provision was numbered § 6(b)(5)) (emphasis added). This addition to the Williams bill was offered by Senator Javits, who explained his amendment:

> ****2494** "As a result of this amendment the Secretary, in setting standards, is expressly required to consider feasibility of proposed standards. This is an improvement over the Daniels bill [as reported out of the House Committee], which might be interpreted to require *absolute* health and safety in all cases, regardless of feasibility, and the Administration bill, which contains no criteria for standards ***516** at all." S.Rep. No. 91-1282, p. 58 (1970), U.S.Code Cong. & Admin.News 1978, p. 5222, Leg.Hist. 197 (emphasis added).[34]

Thus the Senator's concern was that a standard might require "absolute health and safety" without any consideration as to whether such a condition was achievable. The full Senate Committee also noted that standards promulgated under this provision "shall represent feasible requirements," S.Rep. No. 91-1282, at 7, Leg.Hist. 147, and commented that "[s]uch standards should be directed at assuring, *so far as possible*, that no employee will suffer impaired health ...," *ibid.* (emphasis added).

***517** The final amendments to this Senate provision, resulting in § 6(b)(5) of the Act, were proposed and adopted on the Senate floor after the Committee reported out the bill. Senator Dominick, who played a prominent role in this amendment process, see 116 Cong.Rec. 37631 (1970), Leg.Hist. 526 (comments of Sen. Javits); 116 Cong.Rec., at 37631, Leg.Hist. 527 (comments of Sen. Williams), continued to be concerned that the Act might be read to require absolute safety. He therefore proposed that the entire first sentence of § 6(b)(5) be struck, explaining:

> "This requirement is inherently confusing and unrealistic. It could be read to require the Secretary to ban all occupations in which there remains *some* risk of injury, impaired health, or life expectancy. In the case of all occupations, it will be impossible to eliminate all risks to safety and health. Thus, the present criteria could, if literally applied, close every business in this nation. In addition, in many cases, the standard which might most 'adequately' and 'feasibly' assure the elimination of the danger would be the prohibition of the occupation itself." Leg.Hist. 367 (comments of Sen. Dominick on his proposed amendment No. 1054) (emphasis in original).

In the ensuing floor debate on this issue, Senator Dominick reiterated his concern that "[i]t is unrealistic to attempt, as [the Committee's § 6(b)(5)] apparently does, to establish a utopia free from any hazards. Absolute safety is an impossibility...." ****2495** 116 Cong.Rec. 37614 (1970), Leg.Hist. 480.[35] The Senator concluded: "Any administrator responsiblefor ***518** enforcing the statute will be faced with an impossible choice. Either he must forbid employment in all occupations where there is any risk of injury, even if the technical state of the art could not remove the hazard, or he must ignore the mandate of Congress...." 116 Cong.Rec., at 37614, Leg.Hist. 481-482.

Senator Dominick failed in his efforts to have the first sentence of § 6(b)(5) deleted. However, after working with Senators Williams and Javits, he introduced an amended version of the first sentence which he thought was "agreeable to all" and which became § 6(b)(5) as it now appears in the Act. 116 Cong.Rec., at 37622, Leg.Hist. 502. This amendment limited the applicability of § 6(b)(5) to "toxic materials and harmful physical agents," changed "health impairment" to "material impairment of health," and deleted the reference to "diminished life expectancy." Significantly, the feasibility requirement was left intact in the statute. Instead of the phrase "which most adequately and feasibly assures," the amendment merely substituted "which most adequately assures, to the extent feasible," to emphasize that the feasibility requirement operated as a limit on the promulgation of standards under § 6(b)(5).

Senator Dominick believed that his modifications made clearer that attainment of an absolutely safe working environment could not be achieved through "prohibition of the occupation itself," Leg.Hist. 367, and that toxic material and harmful physical agent standards should not address frivolous harms that exist in every workplace. The feasibility requirement, along with the need for a "*material* impairment of health," were thus thought to satisfy these two concerns. He explained the effect of the amendment:

> "What we were trying to do in the bill-unfortunately, ***519** we did not have the proper wording or the proper drafting-was to say that when we are dealing with toxic agents or physical agents, we ought to take such steps as are feasible and practical to provide an atmosphere within which a person's health or safety would not be affected. Unfortunately, we had language providing that anyone would be assured that no one would have a hazard...." 116 Cong.Rec. 37622 (1970), Leg.Hist. 502.

Senator Williams added that the amendment "will provide a continued direction to the Secretary that he shall be required to set the standard which most adequately and to the greatest extent feasible assures" that no employee will suffer any material health impairment. 116 Cong.Rec., Leg.Hist. 503. The Senate thereafter passed S. 2193. One week later, the House passed a substitute bill which failed to contain any substantive criteria for the issuance of health standards in place of its original bill. 116 Cong.Rec., at 38716-38717, Leg.Hist. 1094-1096. At the joint House-Senate Conference, however, the House conferees acceded to the Senate's version of § 6(b)(5).[36]

****2496** **[8]** Not only does the legislative history confirm that Congress meant "feasible" rather than "cost-benefit" when it used the former term, but it also shows that Congress understood that ***520** the Act would create substantial costs for employers, yet intended to impose such costs when necessary to create a safe and healthful working environment.[37] Congress viewed the costs of health and safety as a cost of doing business. Senator Yarborough, a cosponsor of the Williams bill, stated: "We know the costs would be put into consumer goods but that is the price we should pay for the 80 million workers in America." 116 Cong.Rec., at 37345, Leg.Hist. 444. He asked:

"One may well ask too expensive for whom? Is it too expensive for the company who for lack of proper safety equipment loses the services of its skilled employees? Is it too expensive for the employee who loses his hand or leg or eyesight? Is it too expensive for the widow trying to raise her children on meager allowance under workmen's compensation and social security? And what about the man-a good hardworking man-tied to a wheel chair or hospital bed for the rest of his life? That ***521** is what we are dealing with when we talk about industrial safety.

"We are talking about people's lives, not the indifference of some cost accountants." 116 Cong.Rec., at 37625, Leg.Hist. 510.

Senator Eagleton commented that "[t]he costs that will be incurred by employers in meeting the standards of health and safety to be established under this bill are, in my view, *reasonable and necessary costs of doing business*." 116 Cong.Rec., at 41764, Leg.Hist. 1150-1151 (emphasis added). [38]

Other Members of Congress voiced similar views. [39] Nowhere is there any indication that Congress contemplated a different ****2497** balancing by OSHA of the benefits of worker health and safety against the costs of achieving them. Indeed Congress thought that the *financial costs* of health and safety problems in the workplace were as large as or larger than the *financial costs* of eliminating these problems. In its statement ***522** of findings and declaration of purpose encompassed in the Act itself, Congress announced that "personal injuries and illnesses arising out of work situations impose a substantial burden upon, and are a hindrance to, interstate commerce in terms of lost production, wage loss, medical expenses, and disability compensation payments." 29 U.S.C. § 651(a).

"[T]he economic impact of industrial deaths and disability is staggering. Over $1.5 billion is wasted in lost wages, and the annual loss to the Gross National Product is estimated to be over $8 billion. Vast resources that could be available for productive use are siphoned off to pay workmen's compensation benefits and medical expenses." S.Rep. No. 91-1282, p. 2 (1970), U.S.Code Cong. & Admin.News 1970, p. 5178; Leg.Hist. 142.
Senator Eagleton summarized: "Whether we, as individuals, are motivated by simple humanity or by simple economics, we can no longer permit profits to be dependent upon an unsafe or unhealthy worksite." 116 Cong.Rec. 41764 (1970), Leg.Hist. 1150-1151.

III

Section 6(f) of the Act provides that "[t]he determinations of the Secretary shall be conclusive if supported by substantial evidence in the record considered as a whole." 29 U.S.C. § 655(f). Petitioners contend that the Secretary's determination that the Cotton Dust Standard is "economically feasible" is not supported by substantial evidence in the record considered as a whole. In particular, they claim (1) that OSHA underestimated the financial costs necessary to meet the Standard's requirements; and (2) that OSHA incorrectly found that the Standard would not threaten the economic viability of the cotton industry.

In statutes with provisions virtually identical to § 6(f) of the Act, we have defined substantial evidence as "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." ***523** *Universal Camera Corp. v. NLRB*, 340 U.S. 474, 477, 71 S.Ct. 456, 459, 95 L.Ed. 456 (1951). The reviewing court must take into account contradictory evidence in the record, *id.*, at 487-488, 71 S.Ct., at 464, but "the possibility of drawing two inconsistent conclusions from the evidence does not prevent an administrative agency's finding from being supported by substantial evidence," *Consolo v. FMC*, 383 U.S. 607, 620, 86 S.Ct. 1018, 1026, 16 L.Ed.2d 131 (1966). Since the Act places responsibility for determining substantial evidence questions in the courts of appeals, 29 U.S.C. § 655(f), we apply the familiar rule that "[t]his Court will intervene only in what ought to be the rare instance when the [substantial evidence]

standard appears to have been misapprehended or grossly misapplied" by the court below. *Universal Camera Corp. v. NLRB, supra*, 340 U.S., at 491, 71 S.Ct., at 466; see *Mobil Oil Corp. v. FPC*, 417 U.S. 283, 292, 310, 94 S.Ct. 2328, 2346, 41 L.Ed.2d 72 (1974); *FTC v. Standard Oil Co.*, 355 U.S. 396, 400-401, 78 S.Ct. 369, 371, 2 L.Ed.2d 359 (1958). Therefore, our inquiry is not to determine whether we, in the first instance, would find OSHA's findings supported by substantial evidence. Instead we turn to OSHA's findings and the record upon which they were based to decide whether the Court of Appeals "misapprehended or grossly misapplied" the substantial evidence test.

A

OSHA derived its cost estimate for industry compliance with the Cotton Dust Standard after reviewing two financial analyses, one prepared by the Research Triangle Institute (RTI), an OSHA-contracted group, the other by industry representatives (Hocutt-Thomas). **2498 [40] The agency carefully *524 explored the assumptions and methodologies underlying the conclusions of each of these studies. From this exercise the agency was able to build upon conclusions from each which it found reliable and explain its process for choosing its cost estimate. A brief summary of OSHA's treatment of the two studies follows.

OSHA rejected RTI's cost estimate of $1.1 billion for textile industry engineering controls for three principal reasons. [41] First, OSHA believed that RTI's estimate should be discounted by 30%, 43 Fed.Reg. 27372, col. 3 (1978), because that estimate was based on the assumption that engineering controls would be applied to all equipment in mills, including those processing pure synthetic fibers, even though cotton dust is not generated by such equipment. RTI had observed that "[e]xclusion of equipment processing man-made fibers only could reduce these costs by as much as 30 percent." Ex. 6-76, Ct. of App.J.A. 585. [42] Since the Standard did not require controls on synthetics-only equipment, OSHA rejected RTI's assumption about application of controls to synthetics-only machines. 43 Fed.Reg. 27371, col. 3 (1978). Second, OSHA concluded that RTI "may have over-estimated compliance costs since some operations are already in compliance with the permissible exposure limit of the new standard." *Id.*, at 27370, cols. 2 and 3. Evidence indicated that some *525 mills had attained PEL's of 200 ug/m^3 or less, while others were below the 1,000 ug/m^3 total dust level. [43] Therefore, OSHA disagreed with RTI's assumption that the industry had not reduced cotton dust exposure below the existing standard's 1,000 ug/m^3 total dust PEL. *Id.*, at 27370, col. 3. Third, OSHA found that the RTI study suffered from lack of recent accurate industry data. *Id.*, at 27373, col. 1; see Ex. 6-76, Ct. of App.J.A. 858; Ex. 16, *id.*, at 1357, 1359.

In light of these deficiencies in the RTI study, OSHA adopted the Hocutt-Thomas estimate for textile industry engineering **2499 controls of $543 million, [44] emphasizing that, because it was based on the most recent industry data, it was more realistic than RTI's estimate. 43 Fed.Reg. 27373, col. 1 (1978). [45] Nevertheless OSHA concluded that the Hocutt-Thomas *526 estimate was overstated for four principal reasons. First, Hocutt-Thomas included costs of achieving the existing PEL of 1,000 ug/m^3, while OSHA thought it likely that compliance was more widespread and that some mills had in fact achieved the final standard's PEL. *Ibid.*; see n. 43, *supra*. [46] Second, Hocutt-Thomas declined to make any allowance for the trend toward replacement of existing production machines with newer more productive equipment. [47] Relying on this "[n]atural production tren [d]," 43 Fed.Reg. 27359, col. 1 (1978), OSHA concluded that fewer machines than estimated by Hocutt-Thomas would require retrofitting or other controls, *527 *id.*, at 27372, col. 3. Third, OSHA thought that Hocutt-Thomas failed to take into account development of new technologies likely to occur during the 4-year compliance period. *Ibid.* [48] Fourth, OSHA believed that Hocutt-Thomas might have improperly included control costs for synthetics-only machines, *ibid.*, an inclusion which could result in a 30% cost overestimate. [49]

Petitioners criticize OSHA's adoption of the Hocutt-Thomas estimate, since that estimate was based on achievement of somewhat less stringent PEL's than those ultimately promulgated in the final Standard. [50] **2500 Thus, even if the

Hocutt-Thomas estimate was exaggerated, they assert that "only by the most remarkable coincidence would the amount of that overestimate be equal to the additional costs required to attain the far more stringent limits of the Standard OSHA actually adopted." Brief for Petitioners in No. 79-1429, p. 27; see Brief for Petitioner in No. 79-1583, pp. 14-15. The agency itself recognized the problem cited by petitioners, but found itself limited in the precision of its estimates by the ***528** industry's refusal to make more of its own data available. [51] OSHA explained that, "in the absence of the [industry] survey data [of textile mills], OSHA cannot develop more accurate estimates of compliance costs." 43 Fed.Reg. 27373, col. 1 (1978). Since § 6(b)(5) of the Act requires that the Secretary promulgate toxic material and harmful physical agent standards "on the basis of the best available evidence," 29 U.S.C. § 655(b)(5), and since OSHA could not obtain the more detailed confidential industry data it thought essential to further precision, we conclude that the agency acted reasonably in adopting the Hocutt-Thomas estimate. [52] While ***529** a cost estimate based on the standard actually promulgated surely would be preferable, [53] we decline to hold as a matter of law that its absence under the circumstances required the Court of Appeals to find that OSHA's determination was unsupported by substantial evidence. [54]

****2501** **[9]** Therefore, whether or not in the first instance we would find the Secretary's conclusions supported by substantial evidence, we cannot say that the Court of Appeals in this case ***530** "misapprehended or grossly misapplied" the substantial evidence test when it found that "OSHA reasonably evaluated the cost estimates before it, considered criticisms of each, and selected suitable estimates of compliance costs." 199 U.S.App.D.C., at 79, 617 F.2d, at 661 (footnote omitted).

B

After estimating the cost of compliance with the Cotton Dust Standard, OSHA analyzed whether it was "economically feasible" for the cotton industry to bear this cost. [55] OSHA ***531** concluded that it was, finding that "although some marginal employers may shut down rather than comply, the industry as a whole will not be threatened by the capital requirements of the regulation." 43 Fed.Reg. 27378, col. 2 (1978); see *id.*, at 27379, col. 3 ("compliance with the standard is well within the financial capability of the covered industries"). In reaching this conclusion on the Standard's economic impact, OSHA made specific findings with respect to employment, energy consumption, capital financing availability, and profitability. *Id.*, at 27377-27378. To support its findings, the agency relied primarily on RTI's comprehensive investigation of the Standard's economic impact. [56]

RTI evaluated the likely economic impact on the cotton industry and the United States' economy of OSHA's original proposed ****2502** standard, an across-the-board 200 ug/m ^{3} PEL. Ex. 6-76, Ct. of App.J.A. 626. [57] RTI had estimated a total ***532** compliance cost of $2.7 billion for a 200 ug/m ^{3} PEL, [58] and used this estimate in assessing the economic impact of such a standard. *Id.*, at 736-737. As described in n. 44, *supra*, OSHA estimated total compliance costs of $656.5 million for the final Cotton Dust Standard, [59] a standard less stringent than the across-the-board 200 ug/m ^{3} PEL of the proposed standard. Therefore, the agency found that the economic impact of its Standard would be "much less severe" than that suggested by RTI for a 200 ug/m ^{3} PEL estimate of $2.7 billion. 43 Fed.Reg. 27378, col. 2 (1978). Nevertheless, it is instructive to review RTI's conclusions with respect to the economic impact of a $2.7 billion cost estimate. RTI found:

> "Implementation of the proposed [200 ug/m ^{3}] standard will require adjustments within the cotton textile industry that will take time to work themselves out and that may be difficult for many firms. In time, however prices may be expected to rise and markets to adjust so that revenues will cover costs. Although the impact on any one firm cannot be specified in advance, nothing in the RTI study indicates that the cotton textile industry as a whole will be seriously threatened by the impact of the proposed standard for control of cotton dust exposure." Ex. 16, Co. of App.J.A. 1380; *id.*, at 3620.

In reaching this conclusion, RTI analyzed the total and annual economic impact [60] on each of the different sectors of the cotton industry.

***533** For example, in yarn production (opening through spinning), RTI found that the total additional capital requirement per dollar of industry shipment was 7.8 cents, and that the corresponding annual requirement was 1.9 cents. Ex. 6-76, *id.*, at 729. Average price increases necessary to maintain prestandard rates of return on investment were estimated to range from 0.22 cents to 6.25 cents per dollar of industry sales. [61] *Ibid.* ****2503** Even assuming no price increases, only one of the six yarn-producing operations would experience a negative rate of return on investment, while the five other rates of return would range from 1.4% to 3.9%. *Id.*, at 652. [62] ***534** RTI estimated the average prestandard rate of return for the yarn-producing sector as 4.1%. *Ibid.*

Through an output demand elasticity analysis, RTI determined that price increases necessitated by the 200 ug/m^3 standard would result in a 1.68% contraction of cotton yarn consumption. [63] *Id.*, at 685; see *id.*, at 680-687. RTI also discussed the effects of such price increases on interfiber and domestic/foreign competition. RTI observed that "non-price factors have probably dominated" the competition between cotton and manmade fibers. *Id.*, at 623, 948-953. [64] Noting that international trade agreements restricting foreign imports of textile products "have tended to smother the effects of a small change in the relative prices of domestic versus foreign textile products," *id.*, at 622, RTI concluded that such small ***535** changes have had "very little impact" on domestic industries and markets, *id.*, at 961; see *id.*, at 954-961. In order to measure the ability of different sized textile companies to finance compliance costs, RTI constructed a ratio of capital requirements to profit after taxes. RTI found that two of the six yarn production operations would have financing difficulties, but that such difficulties decreased as company size increased. *Id.*, at 730. [65] Finally, impacts on energy costs, employment, inflation, and market structure were evaluated. See *id.*, at 728-731. [66]

****2504** Relying on its comprehensive economic evaluation of the cotton industry's ability to absorb the $2.7 billion compliance cost of a 200 ug/m^3 PEL standard, RTI concluded that "nothing in the RTI study indicates that the cotton textile industry as a whole will be seriously threatened." Ex. 16, *id.*, at 1380. [67] Therefore, it follows *a fortiori* that OSHA's ***536** estimated compliance cost of $656.6 million is "economically feasible." [68] Even if OSHA's estimate was understated, we are fortified in observing that RTI found that a standard more than four times as costly was nevertheless economically feasible.

The Court of Appeals found that the agency "explained the economic impact it projected for the textile industry," and that OSHA has "substantial support in the record for its ... findings of economic feasibility for the textile industry." 199 U.S.App.D.C., at 80, 617 F.2d, at 662. On the basis of the whole record, we cannot conclude that the Court of Appeals "misapprehended or grossly misapplied" the substantial evidence test.

IV

[10] The final Cotton Dust Standard places heavy reliance on the use of respirators to protect employees from exposure to cotton dust, particularly during the 4-year interim period necessary to install and implement feasible engineering controls. [69] One part of the respirator provision requires the ***537** employer to give employees unable to wear a respirator [70] the opportunity to transfer to another position, if available, where the dust level meets the Standard's PEL. 29 CFR § 1910.1043(f)(2)(v) (1980). When such a transfer occurs, the employer must guarantee that the employee suffers no loss of earnings or other employment rights or benefits. [71] Petitioners do not object to the transfer provision, but challenge ****2505** OSHA's authority under the Act to require employers to guarantee employees' wage and employment benefits following the transfer. The Court of Appeals held that OSHA has such authority. 199 U.S.App.D.C., at 93, 617 F.2d, at 675. We hold that, whether or not OSHA has this underlying authority, the agency has failed to make the

necessary determination or statement of reasons that its wage guarantee ***538** requirement is related to the achievement of a safe and healthful work environment.

Respondents urge several statutory bases for the authority exercised here. They cite § 2(b) of the Act, 29 U.S.C. § 651(b), which declares that the purpose of the Act is "to assure so far as possible every working man and woman in the Nation safe and healthful working conditions"; § 2(b)(5), which suggests achievement of the purpose "by developing innovative methods, techniques, and approaches for dealing with occupational safety and health problems"; § 6(b)(5), which requires the agency to "set the standard which most adequately assures ... that no employee will suffer material impairment of health or functional capacity ..."; and § 3(8), which provides that a standard must require "conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment." Brief for Federal Respondent 68. Whatever methods these provisions authorize OSHA to apply, it is clear that such methods must be justified on the basis of their relation to safety or health.

Section 6(f) of the Act, 29 U.S.C. § 655(f), requires that "*determinations* of the Secretary" must be supported by substantial evidence. Section 6(e), 29 U.S.C. § 655(e), requires the Secretary to include "a *statement of the reasons* for such action, which shall be published in the Federal Register." In his "Summary and Explanation of the Standard," the Secretary stated: "Each section includes an analysis of the record evidence and the policy considerations underlying the decisions adopted pertaining to specific provisions of the standard." 43 Fed.Reg. 27380, col. 2 (1978). But OSHA never explained the wage guarantee provision as an approach designed to contribute to increased health protection. Instead the agency stated that the "goal of this provision is to minimize any adverse economic impact on the employee by virtue of the inability to wear a respirator." *Id.*, at 27387, ***539** col. 3. Perhaps in recognition of this fact, respondents in their briefs argue:

> "Experience under the Act has shown that employees are reluctant to disclose symptoms of disease and tend to minimize work-related health problems for fear of being discharged or transferred to a lower paying job.... It may reasonably be expected, therefore, that many employees incapable of using respirators would continue to breathe unhealthful air rather than request a transfer, thus destroying the utility of the respirator program." Brief for Federal Respondent 67.

See Brief for Union Respondents 51. [72]

Whether these arguments have merit, and they very well may, [73] the *post hoc* rationalizations of the agency or the parties to this litigation cannot serve as a sufficient predicate for agency action. See ****2506** *Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402, 419, 91 S.Ct. 814, 825, 28 L.Ed.2d 136 (1971); *Burlington Truck Lines v. United States*, 371 U.S. 156, 168-169, 83 S.Ct. 239, 245, 9 L.Ed.2d 207 (1962); *SEC v.* ***540** *Chenery Corp.*, 318 U.S. 80, 87, 63 S.Ct. 454, 459, 87 L.Ed. 626 (1943). For Congress gave OSHA the responsibility to protect worker health and safety, and to explain its reasons for its actions. Because the Act in no way authorizes OSHA to repair general unfairness to employees that is unrelated to achievement of health and safety goals, we conclude that OSHA acted beyond statutory authority when it issued the wage guarantee regulation. [74]

V

When Congress passed the Occupational Safety and Health Act in 1970, it chose to place pre-eminent value on assuring employees a safe and healthful working environment, limited only by the feasibility of achieving such an environment. We must measure the validity of the Secretary's actions against the requirements of that Act. For "[t]he judicial function does not extend to substantive revision of regulatory ***541** policy. That function lies elsewhere-in Congressional and Executive oversight or amendatory legislation." *Industrial Union Dept. v. American Petroleum Institute, supra*, 448 U.S.,

at 663, 100 S.Ct., at 2875 (BURGER, C. J., concurring); see *TVA v. Hill*, 437 U.S. 153, 185, 187-188, 194-195, 98 S.Ct. 2279, 2297, 2298, 2301, 57 L.Ed.2d 117 (1978). [75]

Accordingly, the judgment of the Court of Appeals is affirmed in all respects except to the extent of its approval of the Secretary's application of the wage guarantee provision of the Cotton Dust Standard at 29 CFR § 1910.1043(f)(2)(v) (1980). To that extent, the judgment of the Court of Appeals is vacated and the case remanded with directions to remand to the Secretary for further proceedings consistent with this opinion.

It is so ordered.

Justice POWELL took no part in the decision of these cases.

****2507** Justice STEWART, dissenting.
Section 6(b)(5) of the Occupational Safety and Health Act provides:

> "The Secretary, in promulgating standards dealing with toxic materials or harmful physical agents under this subsection, shall set the standard which most adequately assures, *to the extent feasible*, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life." 29 U.S.C. § 655(b)(5) (emphasis added).

***542** Everybody agrees that under this statutory provision the Cotton Dust Standard must at least be *economically* feasible, and everybody would also agree, I suppose, that in order to determine whether or not something is economically feasible, one must have a fairly clear idea of how much it is going to cost. Because I believe that OSHA failed to justify its estimate of the cost of the Cotton Dust Standard on the basis of substantial evidence, I would reverse the judgment before us without reaching the question whether the Act requires that a standard, beyond being economically feasible, must meet the demands of a cost-benefit examination.

The simple truth about OSHA's assessment of the cost of the Cotton Dust Standard is that the agency never relied on any study or report purporting to predict the cost to industry of the Standard finally adopted by the agency. OSHA did have before it one cost analysis, that of the Research Triangle Institute, which attempted to predict the cost of the final Standard. However, as recognized by the Court, *ante*, at 2498, the agency flatly rejected that prediction as a gross overestimate. The only other estimate OSHA had, the Hocutt-Thomas estimate prepared by industry researchers, was not designed to predict the cost of the final OSHA Standard. Rather, it assumed a far less stringent and inevitably far less costly standard for all phases of cotton production except roving. *Ante*, at 2499, n. 50. The agency examined the Hocutt-Thomas study, and concluded that it too was an overestimate of the costs of the less stringent standard it was addressing. I am willing to defer to OSHA's determination that the Hocutt-Thomas study was such an overestimate, conceding that such subtle financial and technical matters lie within the discretion and skill of the agency. But in a remarkable nonsequitur, the agency decided that because the Hocutt-Thomas study was an overestimate of the cost of a less stringent standard, it could be treated as a reliable estimate for the more costly final Standard actually promulgated, never rationally explaining how it came to this happy ***543** conclusion. This is not substantial evidence. It is unsupported speculation.

Of course, as the Court notes, this Court will re-examine a court of appeals' review of a question of substantial evidence "only in what ought to be the rare instance when the standard appears to have been misapprehended or grossly misapplied." *Universal Camera Corp. v. NLRB*, 340 U.S. 474, 491, 71 S.Ct. 456, 466, 95 L.Ed. 456. But I think this is one of those rare instances where an agency has categorically misconceived the nature of the evidence necessary to support a regulation, and where the Court of Appeals has failed to correct the agency's error. Of course, broad generalizations

about the meaning of "substantial evidence" have limited value in deciding particular cases. But within the confines of a single statute, where the agency and reviewing courts have identified certain specific factual matters to be proved, we can establish practical general criteria for comprehending "substantial evidence."

Unlike the Court, I think it clear to the point of being obvious that, as a matter of law, OSHA's prediction of the cost of the Cotton Dust Standard lacks a basis in substantial evidence, since the agency did not rely on even a single estimate of the cost of the actual Standard it promulgated. Accordingly, I respectfully dissent.

****2508** Justice REHNQUIST, with whom THE CHIEF JUSTICE joins, dissenting.

A year ago I stated my belief that Congress in enacting § 6(b)(5) of the Occupational Safety and Health Act of 1970 unconstitutionally delegated to the Executive Branch the authority to make the "hard policy choices" properly the task of the legislature. *Industrial Union Dept. v. American Petroleum Institute*, 448 U.S. 607, 671, 100 S.Ct. 2844, 2878, 65 L.Ed.2d 1010 (1980) (concurring in judgment). Because I continue to believe that the Act exceeds Congress' power to delegate legislative authority to nonelected officials, see *J. W. Hampton & Co. v. United* ***544** *States*, 276 U.S. 394, 48 S.Ct. 348, 72 L.Ed. 624 (1928), and *Panama Refining Co. v. Ryan*, 293 U.S. 388, 55 S.Ct. 241, 79 L.Ed. 446 (1935), I dissent.

I will repeat only a little of what I said last Term. Section 6(b)(5) provides in pertinent part:

> "The Secretary, in promulgating standards dealing with toxic materials or harmful physical agents under this subsection, shall set the standard which most adequately assures, *to the extent feasible*, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life." (Emphasis added.)

As the Court correctly observes, the phrase "to the extent feasible" contains the critical language for the purpose of these cases. We are presented with a remarkable range of interpretations of that language. Petitioners contend that the statute *requires* the Secretary to demonstrate that the benefits of its "Cotton Dust Standard," in terms of reducing health risks, bear a reasonable relationship to its costs. Brief for Petitioners in No. 79-1429, pp. 38-41. Respondents, including the Secretary of Labor at least until his postargument motion, counter that Congress itself balanced costs and benefits when it enacted the statute, and that the statute *prohibits* the Secretary from engaging in a cost-benefit type balancing. Their view is that the Act merely requires the Secretary to promulgate standards that eliminate or reduce such risks "to the extent ... technologically or economically feasible." Brief for Federal Respondent 38; Brief for Union Respondents 26-27. As I read the Court's opinion, it takes a different position. It concludes that, at least as to the "Cotton Dust Standard," the Act does not require the Secretary to engage in a cost-benefit analysis, which suggests of course that the Act *permits* the Secretary to undertake such an analysis if he so chooses. *Ante*, at 2491-2492.

***545** Throughout its opinion, the Court refers to § 6(b)(5) as adopting a "feasibility standard" or a "feasibility requirement." *Ante*, at 2490-2497. But as I attempted to point out last Term in *Industrial Union Dept. v. American Petroleum Institute, supra*, 448 U.S., at 681-685, 100 S.Ct., at 2883-2885, the "feasibility standard" is no standard at all. Quite the contrary, I argued there that the insertion into § 6(b)(5) of the words "to the extent feasible" rendered what had been a clear, if somewhat unrealistic, statute into one so vague and precatory as to be an unconstitutional delegation of legislative authority to the Executive Branch. Prior to the inclusion of the "feasibility" language, § 6(b)(5) simply required the Secretary to "set the standard which most adequately assures, on the basis of the best available professional evidence, that no employee will suffer any impairment of health...." Legislative History, Occupational Safety and Health Act of 1970, p. 943 (Comm. Print 1971) (hereinafter Leg.Hist.). Had that statute been enacted, it would undoubtedly support the result the Court reaches in these cases, and it would not have created an excessive delegation problem. The

Secretary of Labor would quite clearly have been authorized to set exposure standards without regard to any kind of cost-benefit analysis.

But Congress did not enact that statute. The legislative history of the Act reveals **2509 that a number of Members of Congress, such as Senators Javits, Saxbe, and Dominick, had difficulty with the proposed statute and engaged Congress in a lengthy debate about the extent to which the Secretary should be authorized to create a risk-free work environment. Congress had at least three choices. It could have required the Secretary to engage in a cost-benefit analysis prior to the setting of exposure levels, it could have prohibited cost-benefit analysis, or it could have permitted the use of such an analysis. Rather than make that choice and resolve that difficult policy issue, however, Congress passed. Congress simply said that the Secretary should set standards "to the extent feasible." Last year, Justice POWELL reflected that *546 "one might wish that Congress had spoken with greater clarity." *American Petroleum Institute,* 448 U.S., at 668, 100 S.Ct., at 2877 (POWELL, J., concurring in part and in judgment). I am convinced that the reason that Congress did not speak with greater "clarity" was because it could not. The words "to the extent feasible" were used to mask a fundamental policy disagreement in Congress. I have no doubt that if Congress had been required to choose whether to mandate, permit, or prohibit the Secretary from engaging in a cost-benefit analysis, there would have been no bill for the President to sign.

The Court seems to argue that Congress *did* make a policy choice when it enacted the "feasibility" language. Its view is that Congress required the Secretary to engage in something called "feasibility analysis." *Ante*, at 2490. But those words mean nothing at all. They are a "legislative mirage, appearing to some Members [of Congress] but not to others, and assuming any form desired by the beholder." *American Petroleum Institute, supra*, at 681, 100 S.Ct., at 2883. Even the Court does not settle on a meaning. It first suggests that the language requires the Secretary to do what is "capable of being done." *Ante*, at 2490. But, if that is all the language means, it is merely precatory and "no more than an admonition to the Secretary to do his duty...." Leg.Hist. 367 (remarks of Sen. Dominick). The Court then seems to adopt the Secretary's view that feasibility means "technological and economic feasibility." But there is nothing in the words of § 6(b)(5), or their legislative history, to suggest why they should be so limited. One wonders why the "requirement" of § 6(b)(5) could not include considerations of administrative or even political feasibility. As even the Court recognizes, when Congress has wanted to limit the concept of feasibility to technological and economic feasibility, it has said so. *Ante*, at 2491. Thus the words "to the extent feasible" provide no meaningful guidance to those who will administer the law.

*547 In believing that § 6(b)(5) amounts to an unconstitutional delegation of legislative authority to the Executive Branch, I do not mean to suggest that Congress, in enacting a statute, must resolve all ambiguities or must "fill in all of the blanks." Even the neophyte student of government realizes that legislation is the art of compromise, and that an important, controversial bill is seldom enacted by Congress in the form in which it is first introduced. It is not unusual for the various factions supporting or opposing a proposal to accept some departure from the language they would prefer and to adopt substitute language agreeable to all. But that sort of compromise is a far cry from this case, where Congress simply abdicated its responsibility for the making of a fundamental and most difficult policy choice-whether and to what extent "the statistical possibility of future deaths should ... be disregarded in light of the economic costs of preventing those deaths." *American Petroleum Institute, supra*, at 672, 100 S.Ct., at 2879. That is a "quintessential legislative" choice and must be made by the elected representatives of the people, not by nonelected officials in the Executive Branch. As stated last Term:

> "In drafting § 6(b)(5), Congress was faced with a clear, if difficult, choice between balancing statistical lives and industrial resources or authorizing the Secretary to elevate human life above all **2510 concerns save massive dislocation in an affected industry. That Congress recognized the difficulty of this choice is clear.... That Congress chose, intentionally or unintentionally, to pass this difficult choice on to the Secretary is evident from the spectral quality of the standard it selected." 448 U.S., at 685, 100 S.Ct., at 2885.

In sum, the Court is quite correct in asserting that the phrase "to the extent feasible" is the critical language for the purposes of these cases. But that language is critical, not because it establishes a general standard by which those charged *548 with administering the statute may be guided, but because it has precisely the opposite effect: in failing to agree

on whether the Secretary should be either mandated, permitted, or prohibited from undertaking a cost-benefit analysis, Congress simply left the crucial policy choices in the hands of the Secretary of Labor. * As I stated at greater length last Term, I believe that in so doing Congress unconstitutionally delegated its legislative responsibility to the Executive Branch.

All Citations

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Footnotes

* The syllabus constitutes no part of the opinion of the Court but has been prepared by the Reporter of Decisions for the convenience of the reader. See *United States v. Detroit Lumber Co.*, 200 U.S. 321, 337, 26 S.Ct. 282, 287, 50 L.Ed.2d 499.

1 This opinion will use the terms OSHA and the Secretary interchangeably when referring to the agency, the Secretary of Labor, or the Assistant Secretary for Occupational Safety and Health. The Secretary of Labor has delegated the authority to promulgate occupational safety and health standards to the Assistant Secretary. See 29 CFR § 1910.4 (1980).

2 Petitioners in No. 79-1429 include 12 individual cotton textile manufacturers, and the American Textile Manufacturers Institute, Inc. (ATMI), a trade association representing approximately 175 companies. Brief for Petitioners in No. 79-1429, pp. i, 2. In No. 79-1583, petitioner is the National Cotton Council of America, a non-profit corporation chartered for the purpose of increasing the consumption of cotton and cotton products. Brief for Petitioner in No. 79-1583, pp. 3-4.

3 The two labor organizations are the American Federation of Labor and Congress of Industrial Organizations, Industrial Union Department, AFL-CIO, and the Amalgamated Clothing & Textile Workers Union, AFL-CIO. In the Court of Appeals, the labor organizations challenged the Cotton Dust Standard as not sufficiently stringent.

4 Justice POWELL, concurring in part and in the judgment, was the only member of the Court to decide the cost-benefit issue expressly. Justice POWELL concluded that the statute "requires the agency to determine that the economic effects of its standard bear a reasonable relationship to the expected benefits." *Industrial Union Dept. v. American Petroleum Institute*, 448 U.S., at 667, 100 S.Ct., at 2877. Justice MARSHALL, dissenting, joined by Justice BRENNAN, Justice WHITE, and Justice BLACKMUN, indicated that the statute did not contemplate cost-benefit analysis. See *id.*, at 717-718, n.30, 719-720, n.32, 100 S.Ct., at 2902, n.30, 2903, n.32.

5 In addition to the cost-benefit issue, the other questions presented and addressed are (1) whether substantial evidence in the record as a whole supports OSHA's determination that the Cotton Dust Standard is economically feasible; and (2) whether OSHA has the authority under the Act to require that employers guarantee the wages and benefits of employees who are transferred to other positions because of their inability to wear respirators.

6 Cotton dust is defined as "dust present in the air during the handling or processing of cotton, which may contain a mixture of many substances including ground up plant matter, fiber, bacteria, fungi, soil, pesticides, non-cotton plant matter and other contaminants which may have accumulated with the cotton during the growing, harvesting and subsequent processing or storage periods. Any dust present during the handling and processing of cotton through the weaving or knitting of fabrics, and dust present in other operations or manufacturing processes using new or waste cotton fibers or cotton fiber by-products from textile mills are considered cotton dust." 29 CFR § 1910.1043(b) (1980) (Cotton Dust Standard).

7 References are made throughout this opinion to the Joint Appendix filed in this Court (App.), and to the Joint Appendix lodged in the Court of Appeals below (Ct. of App.J.A.).

8 Known generally as the Schilling classification grades, they include:

"[Grade] ½: slight acute effect of dust on ventilatory capacity; no evidence of chronic ventilatory impairment.

"[Grade] 1: definite acute effect of dust on ventilatory capacity; no evidence of chronic ventilatory impairment.

"[Grade] 2: evidence of slight to moderate irreversible impairment of ventilatory capacity.

"[Grade] 3: evidence of moderate to severe irreversible impairment of ventilatory capacity." Exhibit 6-27, App. 25; see 41 Fed.Reg. 56500-56501 (1976).

9 Descriptions of the disease by individual mill workers, presented in hearings on the Cotton Dust Standard before an Administrative Law Judge, are more vivid:

"When they started speeding the looms up the dust got finer and more and more people started leaving the mill with breathing problems. My mother had to leave the mill in the early fifties. Before she left, her breathing got so short she just

couldn't hold out to work. My stepfather left the mill on account of breaching [*sic*] problems. He had coughing spells til he couldn't breath [*sic*], like a child's whooping cough. Both my sisters who work in the mill have breathing problems. My husband had to give up his job when he was only fifty-four years old because of the breathing problems." Ct. of App.J.A. 3791.

"I suppose I had a breathing problem since 1973. I just kept on getting sick and began losing time at the mill. Every time that I go into the mill I get deathly sick, choking and vomiting losing my breath. It would blow down all that lint and cotton and I have clothes right here where I have wore and they had been washed several times and I would like for you all to see them. That will not come out in washing.

"I am only fifty-seven years old and I am retired and I can't even get to go to church because of my breathing. I get short of breath just walking around the house or dressing [or] sometimes just watching T.V. I cough all the time." *Id.*, at 3793.

"... I had to quit because I couldn't lay down and rest without oxygen in the night and my doctor told me I would have to get out of there.... I couln't [*sic*] even breathe, I had to get out of the door so I could breathe and he told me not to go back in [the mill] under any circumstances." *Id.*, at 3804.

Byssinosis is not a newly discovered disease, having been described as early as in the 1820's in England, App. 404-405, and observed in Belgium in a study of 2,000 cotton workers in 1845, Exhibit 6-16, App. 15.

10 As an expert representing the industry noted:

"[T]he assumption is often made that the disorder progresses from ½ to 1 to 2 to 3 and, thus, all grades reflect the progress of the individual's disability. In many instances, however, there is no progression at all. Sometimes Grade 3 seems to appear *de novo*, or there is a jump from 1 to 3 Among those who develop permanent disability, Grade 2 very often never occurs." Exhibit 41, App. 192.

11 The criterion of disability used for the 35,000-worker estimate was a Forced Expiratory Volume (FEV_1) measurement of pulmonary function of 1.2 liters or less. 43 Fed.Reg. 27353, col. 3 (1978). An FEV_1 of 1.2 liters "is a small fraction of the pulmonary performance of a normal lung." *Ibid.*; Ct. of App.J.A. 1231.

12 There are between 126,000 and 200,000 active workers in the yarn-preparation and manufacturing segments of the cotton industry. 43 Fed.Reg. 27379, col. 2 (1978).

13 Indeed the Senate Report on the Act expressly observed:

"Studies of particular industries provide specific emphasis regarding the magnitude of the problem. For example, despite repeated warnings over the years from other countries that their cotton workers suffered from lung disease, it is only within the past decade that we have recognized byssinosis as a distinct occupational disease among workers in American cotton mills." S.Rep.No.91-1282, p. 3 (1970), U.S.Code Cong. & Admin.News 1970, p. 5179, Leg.Hist. 143.

14 "Total dust" includes both respirable and nonrespirable cotton dust.

15 The Secretary of Labor adopted the threshold limit values contained in a list that had been prepared by the ACGIH.

16 Section 6(a) of the Act, as set forth in 29 U.S.C. § 655(a), provides in pertinent part:

> "[T]he Secretary shall, as soon as practicable during the period beginning with the effective date of this chapter and ending two years after such date, by rule promulgate as an occupational safety or health standard ... any established Federal standard, unless he determines that the promulgation of such a standard would not result in improved safety or health for specifically designated employees."

17 In many cotton-preparation and manufacturing operations, including opening, picking, and carding, 1,000 ug/m^3 of total dust is roughly equivalent to 500 ug/m^3 of respirable dust. App. 464; 43 Fed.Reg. 27361, col. 2 (1978); see n. 22, *infra*.

18 The Act established the National Institute for Occupational Safety and Health as part of the then Department of Health, Education, and Welfare. NIOSH is authorized, *inter alia*, to "develop and establish recommended occupational safety and health standards." 29 U.S.C. § 671(c)(1). At the request of the Secretary of Labor or the Secretary of HEW, or on his own initiative, the Director of NIOSH may "conduct such research and experimental programs as he determines are necessary for the development of criteria for new and improved occupational safety and health standards, and ... after consideration of the results of such research and experimental programs make recommendations concerning new or improved occupational safety and health standards." § 671(d).

19 NIOSH presented its recommendation in a lengthy and detailed document entitled "Criteria for a Recommended Standard: Occupational Exposure to Cotton Dust." Ex. 1, Ct. of App.J.A. 11-169. The report examined the effects of cotton dust exposure and suggested implementation of work practices, engineering controls, medical surveillance, and monitoring to decrease exposure to the recommended level.

20 The Act specifies an informal rulemaking procedure to accompany the promulgation of occupational safety and health standards. See 29 U.S.C. §§ 655(b)(2), (3), (4).

21 The Standard provides that exposure to lint-free respirable cotton dust may be measured by a vertical elutriator, with its 15-micron particle size cutoff, or "a method of equivalent accuracy and precision." 29 CFR § 1910.1043(c) (1980).

22 The manufacturing of cotton textile products is divided into several different stages. (1) In the operation of *opening, picking, carding, drawing*, and *roving*, raw cotton is cleaned and prepared for spinning into yarn. Brief for Petitioners in No. 79-1429, p. 7, n. 12. (2) In the operations of *spinning, twisting, winding, spooling*, and *warping*, the prepared cotton is made into yarn and readied for weaving and other processing. *Id.*, at 7, n. 13. (3) In *slashing* and *weaving*, the yarn is manufactured into a woven fabric. *Id.*, at 7, n. 14. The Cotton Dust Standard defines "yarn manufacturing" to mean "all textile mill operations from opening to, but not including, slashing and weaving." 29 CFR § 1910.1043(b) (1980). See generally 43 Fed.Reg. 27365, cols. 1 and 2 (1978).

> The nontextile industries covered by the Standard's 500 ug/m ^{3} PEL include, but are not limited to, "warehousing, compressing of cotton lint, classing and marketing, using cotton yarn (i. e. knitting), reclaiming and marketing of textile manufacturing waste, delinting of cottonseed, marketing and converting of linters, reclaiming and marketing of gin motes and batting, yarn felt manufacturing using waste cotton fibers and by products." *Id.*, at 27360, col. 3.

23 Ventilation systems include general controls, such as central air-conditioning, and local exhaust controls, with capture emissions of cotton dust as close to the point of generation as possible. See *id.*, at 27363-27364.

24 The court remanded to the agency that portion of the Standard dealing with the cottonseed oil industry, after concluding that the record failed to establish adequately the Standard's economic feasibility. *AFL-CIO v. Marshall*, 199 U.S.App.D.C. 54, 87, 95, 617 F.2d 636, 669, 677 (1979).

25 The postargument motions of the several parties for leave to file supplemental memoranda are granted. We decline to adopt the suggestion of the Secretary of Labor that we should "vacate the judgment of the court of appeals and remand the case so that the record may be returned to the Secretary for further consideration and development." Supplemental Memorandum for Federal Respondent 4. We also decline to adopt the suggestion of petitioners that we should "hold these cases in abeyance and ... remand the record to the court of appeals with an instruction that the record be remanded to the agency for further proceedings." Response of Petitioners to Supplemental Memorandum for Federal Respondent 4.

> At oral argument, and in a letter addressed to the Court after oral argument, petitioners contended that the Secretary's recent amendment of OSHA's so-called "Cancer Policy" in light of this Court's decision in *Industrial Union Dept. v. American Petroleum Institute*, 448 U.S. 607, 100 S.Ct. 2844, 65 L.Ed.2d 1010 (1980), was relevant to the issues in the present cases. We disagree.
>
> OSHA amended its Cancer Policy to "carry out the Court's interpretation of the Occupational Safety and Health Act of 1970 that consideration must be given to the significance of the risk in the issuance of a carcinogen standard and that OSHA must consider all relevant evidence in making these determinations." 46 Fed.Reg. 4889, col. 3 (1981). Previously, although lacking such evidence as dose-response data, the Secretary presumed that no safe exposure level existed for carcinogenic substances. *Industrial Union Dept. v. American Petroleum Institute, supra*, at 620, 624-625, 635-636, nn. 39 and 40, 100 S.Ct., at 2853, 2855, 2861, nn. 39 and 40 (plurality opinion). Following this Court's decision, OSHA deleted those provisions of the Cancer Policy which required the "automatic setting of the lowest feasible level" without regard to determinations of risk significance. 46 Fed.Reg. 4890, col. 1 (1981).
>
> In distinct contrast with its Cancer Policy, OSHA expressly found that "exposure to cotton dust presents a significant health hazard to employees," 43 Fed.Reg. 27350, col. 1 (1978), and that "cotton dust produced significant health effects at low levels of exposure," *id.*, at 27358, col. 2. In addition, the agency noted that "grade ½ byssinosis and associated pulmonary function decrements are significant health effects in themselves and should be prevented in so far as possible." *Id.*, at 27354, col. 2. In making its assessment of significant risk, OSHA relied on dose-response curve data (the Merchant Study) showing that 25% of employees suffered at least Grade ½ byssinosis at a 500 ug/m ^{3} PEL, and that 12.7% of all employees would suffer byssinosis at the 200 ug/m ^{3} PEL standard. *Id.*, at 27358, cols. 2 and 3. Examining the Merchant Study in light of other studies in the record, the agency found that "the Merchant study provides a reliable assessment of health risk to cotton textile workers from cotton dust." Id., at 27357, col. 3. OSHA concluded that the "prevalence of byssinosis should be significantly reduced" by the 200 ug/m ^{3} PEL. *Id.*, at 27359, col. 3; see *id.*, at 27359, col. 1 ("200 ug/m ^{3} represents a significant reduction in the number of affected workers"). It is difficult to imagine what else the agency could do to comply with this Court's decision in *Industrial Union Dept. v. American Petroleum Institute*.

26 Petitioners ATMI et al. express their position in several ways. They maintain that OSHA "is required to show that a reasonable relationship exists between the risk reduction benefits and the costs of its standards." Brief for Petitioners in No. 79-1429,

p. 36. Petitioners also suggest that OSHA must show that "the standard is expected to achieve a *significant reduction in* [the significant risk of material health impairment]" based on "an assessment of the costs of achieving it." *Id.*, at 38, 40. Allowing that "[t]his does not mean that OSHA must engage in a rigidly formal cost-benefit calculation that places a dollar value on employee lives or health," *id.*, at 39, petitioners describe the required exercise as follows:

"First, OSHA must make a responsible determination of the costs and risk reduction benefits of its standard. Pursuant to the requirement of Section 6(f) of the Act, this determination must be factually supported by substantial evidence in the record. The subsequent determination whether the reduction in health risk is 'significant' (based upon the factual assessment of costs and benefits) is a judgment to be made by the agency in the first instance." *Id.*, at 40.

Respondent Secretary disputes petitioners' description of the exercise, claiming that any meaningful balancing must involve "placing a [dollar] value on human life and freedom from suffering," Brief for Federal Respondent 59, and that there is no other way but through formal cost-benefit analysis to accomplish petitioners' desired balancing, *id.*, at 59-60. Cost-benefit analysis contemplates "systematic enumeration of all benefits and all costs, tangible and intangible, whether readily quantifiable or difficult to measure, that will accrue to all members of society if a particular project is adopted." E. Stokey & R. Zeckhauser, A Primer for Policy Analysis 134 (1978); see Commission on Natural Resources, National Research Council, Decision Making for Regulating Chemicals in the Environment 38 (1975). See generally E. Mishan, Cost-Benefit Analysis (1976); Prest & Turvey, Cost-Benefit Analysis, 300 Economic Journal 683 (1965). Whether petitioners' or respondent's characterization is correct, we will sometimes refer to petitioners' proposed exercise as "cost-benefit analysis."

27 As described by the union respondents, the test for determining whether a standard promulgated to regulate a "toxic material or harmful physical agent" satisfies the Act has three parts:

"First, whether the 'place of employment is unsafe-in the sense that significant risks are present and can be eliminated or lessened by a change in practices.' [*Industrial Union Dept., supra*, at 642, 100 S.Ct., at 2864 (plurality opinion).] Second, whether of the possible available correctives the Secretary has selected '*the* standard ... that is most protective.' *Ibid.* Third, whether that standard is 'feasible.' " Brief for Union Respondents 40-41.

We will sometimes refer to this test as "feasibility analysis."

28 Section 6(b)(5) of the Act, 29 U.S.C. § 655(b)(5), also provides:

> "Development of standards under this subsection shall be based upon research, demonstrations, experiments, and such other information as may be appropriate. In addition to the attainment of the highest degree of health and safety protection for the employee, other considerations shall be the latest available scientific data in the field, the feasibility of the standards, and experience gained under this and other health and safety laws. Whenever practicable, the standard promulgated shall be expressed in terms of objective criteria, and of the performance desired."

29 In these cases we are faced with the issue whether the Act requires OSHA to balance costs and benefits in promulgating a *single* toxic material and harmful physical agent standard under § 6(b)(5) Petitioners argue that without cost-benefit balancing, the issuance of a single standard might result in a "serious misallocatio[n] of the finite resources that are available for the protection of worker safety and health," given the other health hazards in the workplace. Reply Brief for Petitioners in No. 79-1429, p. 10; see Brief for Petitioners in No. 79-1429, pp. 38-39; Brief for Chamber of Commerce of United States as *Amicus Curiae* 12; Brief for American Industrial Health Council as *Amicus Curiae* 19. This argument is more properly addressed to other provisions of the Act which may authorize OSHA to explore costs and benefits for deciding between issuance of several standards regulating different varieties of health and safety hazards, *e. g.*, § 6(g) of the Act, 29 U.S.C. § 655(g); see *Industrial Union Dept. v. American Petroleum Institute*, 448 U.S., at 643-644, 100 S.Ct., at 2865; see also Case Comment, 60 B.U.L.Rev. 115, 122, n. 52 (1980), or for promulgating other types of standards not issued under § 6(b)(5). We express no view on these questions.

30 See, *e. g.*, Energy Policy and Conservation Act of 1975, 42 U.S.C. §§ 6295(c), (d) (1976 ed., Supp.III); Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. §§ 1312(b)(1), (2), 1314(b)(1)(B); Clean Water Act of 1977, 33 U.S.C. § 1314(b)(4)(B) (1976 ed., Supp.III); Clean Air Act Amendments of 1970, 42 U.S.C. § 7545(c)(2)(B) (1976 ed., Supp.III). In the Federal Water Pollution Control Act Amendments of 1972, Congress directed the Administrator to consider "the total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application." 33 U.S.C. § 1314(b)(1) ("BPT" limitations). With regard to 1987 effluent limitations, the Administrator is directed to consider total cost, but not in comparison with effluent reduction benefits. § 1314(b)(2)(B) ("BAT" limitations). See *EPA v. National Crushed Stone Assn.*, 449 U.S. 64, 71, n. 10, 76-77, 101 S.Ct. 295, 300, n. 10, 303, 66 L.Ed.2d 268 (1980).

In other statutes, Congress has used the phrase "unreasonable risk," accompanied by explanation in legislative history, to signify a generalized balancing of costs and benefits. See, *e. g.*, the Consumer Product Safety Act of 1972, 15 U.S.C. § 2056(a) ("unreasonable risk of injury"); H.R.Rep. No. 92-1153, p. 33 (1972) (where the House stated: "It should be noted

that the Commission's authority to promulgate standards under this bill is limited to instances where the hazard associated with a consumer product presents an unreasonable risk of death, injury, or serious or frequent illness.... Protection against unreasonable risks is central to many Federal and State safety statutes and the courts have had broad experience in interpreting the term's meaning and application. It is generally expected that the determination of unreasonable hazard will involve the Commission in balancing the probability that risk will result in harm and the gravity of such harm against the effect on the product's utility, cost, and availability to the consumer"); S.Rep. No. 92-749, pp. 14-15 (1972). See also *Aqua Slide 'N' Dive Corp. v. Consumer Product Safety Comm'n*, 569 F.2d 831, 839 (CA5 1978); *Forester v. Consumer Product Safety Comm'n*, 182 U.S.App.D.C. 153, 168, 559 F.2d 774, 789 (1977). The error of several cases finding a cost-benefit analysis mandate in the Act is their reliance on the different language and clear legislative history of the Consumer Product Safety Act to reach their conclusions. See *Texas Independent Ginners Assn. v. Marshall*, 630 F.2d 398, 410 (CA5 1980); *American Petroleum Institute v. OSHA*, 581 F.2d 493, 502-503 (CA5 1978) aff'd on other grounds, *Industrial Union Dept. v. American Petroleum Institute, supra*.

Senator Chiles was sufficiently certain that the Act did not contemplate cost-benefit analysis that he introduced in amendment in 1973 that, *inter alia*, "directs the Secretary to recognize the cost-benefit ratio in promulgating a new standard and to publish information relative to the projected financial impact. This provision will promote the development of standards justifiable in terms of the benefits to be derived and afford those to be affected an opportunity to make a reasoned evaluation of the proposal." 119 Cong.Rec. 42151 (1973).

31 In addition, as the legislative history makes plain, see *infra*, at 2494-2495, any standard that was not economically or technologically feasible would *a fortiori* not be "reasonably necessary or appropriate" under the Act. See *Industrial Union Dept. v. Hodgson*, 162 U.S.App.D.C. 331, 342, 499 F.2d 467, 478 (1974) ("Congress does not appear to have intended to protect employees by putting their employers out of business").

32 This is not to say that § 3(8) might not require the balancing of costs and benefits for standards promulgated under provisions other than § 6(b)(5) of the Act. As a plurality of this Court noted in *Industrial Union Dept.*, if § 3(8) had no substantive content, "there would be no statutory criteria at all to guide the Secretary in promulgating either national consensus standards or permanent standards other than those dealing with toxic materials and harmful physical agents." 448 U.S., at 640, n.45, 100 S.Ct., at 2863, n.45. Furthermore, the mere fact that a § 6(b)(5) standard is "feasible" does not mean that § 3(8)'s "reasonably necessary or appropriate" language might not impose additional restraints on OSHA. For example, all § 6(b)(5) standards must be addressed to "significant risks" of material health impairment. *Id.*, at 642, 100 S.Ct., at 2864. In addition, if the use of one respirator would achieve the same reduction in health risk as the use of five, the use of five respirators was "technologically and economically feasible," and OSHA thus insisted on the use of five, then the "reasonably necessary or appropriate" limitation might come into play as an additional restriction on OSHA to choose the one-respirator standard. In this case we need not decide all the applications that § 3(8) might have, either alone or together with § 6(b)(5).

33 Although both versions of the Act contained provisions identical to § 3(8), 29 U.S.C. § 652(8), there is no discussion in the legislative history of the meaning of the phrase "reasonably necessary or appropriate."

34 Petitioners' primary legislative history argument is that Senator Javits "took the position that OSHA standards should be 'feasible' in the sense of being 'reasonable' and 'practical' as well as technologically achievable." Brief for Petitioners in No. 79-1429, p. 32. A review of the record belies this contention. Senator Javits himself had introduced the administration's bill, S. 2788, 91st Cong., 1st Sess. (1969), which he observed contained no criteria for issuance of standards. Leg.Hist. 31, 39-42. That proposed legislation, which established a National Occupational Safety and Health Board to promulgate standards, required the Board to submit proposed standards to an appropriate national standards-producing organization "to prepare a report on the technical feasibility, reasonableness and practicality of such standard." *Id.*, at 39. Furthermore, either the Secretary of Labor or the Secretary of Health, Education, and Welfare could object to a proposed standard on the basis, *inter alia*, that it "is not feasible," *id.*, at 40, at which point the Board could reaffirm the standard by a majority vote, *ibid.* President Nixon's message accompanying S. 2788, which Senator Javits inserted in the Congressional Record, described the "report on the technical feasibility, reasonableness and practicality of such standard" under the Act as a "report on the feasibility of the proposed standards." 115 Cong.Rec. 22517 (1969).

From this slim reed petitioners fashion their legislative history argument. But even if Senator Javits fully subscribed to statements by President Nixon on the proposed legislation, of which there is some doubt, see *id.*, at 22512, this hardly supports the view that the Senator's addition of the feasibility requirement to the Williams bill included any such baggage. After all, the Senator described his amendment only with the word "feasible," and specifically distinguished the amended Williams bill from the administration's, on the basis of the latter's lack of criteria.

35 Senator Dominick gave several examples. For instance:

"[L]et us take a fellow who is a streetcar conductor or a bus conductor at the present time. How in the world, in the process of the pollution we have in the streets or in the process of automobile accidents that we have all during a working day of anyone driving a bus or trolley car, or whatever it may be, can we set standards that will make sure he will not have any risk to his life for the rest of his life? It is totally impossible for this to be put in a bill; and yet it is in the committee bill." 116 Cong.Rec. 37337 (1970), Leg.Hist. 423. See also 116 Cong.Rec., at 37614, 36522, Leg.Hist. 481, 345.

36 In acceding, the House obtained Senate agreement to another amendment, now § 6(b)(6)(A) of the Act, that allowed employers to petition for a temporary variance from an occupational safety and health standard in certain cases, except that "[e]conomic hardship is not to be a consideration for the qualification for a temporary extension order." H.R.Conf. Rep. No. 91-1765, p. 35 (1970), U.S.Code Cong. & Admin.News 1970, p. 5231, Leg.Hist. 1188. The Conference Report limited the variance procedure to the following cases:

"unavailability of professional or technical personnel or of necessary materials or equipment or because necessary construction or alteration of facilities cannot be completed on time.... Such an order may be issued for a maximum period of one year and may not be renewed more than twice." *Ibid.*, U.S.Code Cong. & Admin.News 1970, p. 5231.

37 Because the costs of compliance would weigh particularly heavily on small businesses, Congress provided in § 28 of the Act an amendment to the Small Business Act, 15 U.S.C. § 636, making small businesses eligible for economic assistance through the Small Business Administration to comply with standards promulgated by the Secretary. 84 Stat. 1618, Leg.Hist. 1257. Senator Dominick explained:

"There is a provision in the bill which recognizes the impact that this particular legislation may have on small businesses.... It permits the Secretary to make loans to small businesses wherever the standards that are set by the National Government are so severe as to have caused a real and substantial economic injury. Under those circumstances the Secretary is entitled, through the Small Business Administration, to make loans to those businesses to get them over the hump, because of the need for new equipment, or because of new conditions within the shop, which would permit them to continue in operation. "I think that is a very significant and important provision for minimizing economic injury which could occur if the bill resulted in situations which would have very serious effects on businesses." 116 Cong.Rec. 37631 (1970), Leg.Hist. 525.

38 Congress was concerned that some employers not obtain a competitive advantage over others by declining to invest in worker health and safety:

"Although many employers in all industries have demonstrated an exemplary degree of concern for health and safety in the workplace, their efforts are too often undercut by those who are not so concerned. Moreover, the fact is that many employers-particularly smaller ones-simply cannot make the necessary investment in health and safety, and survive competitively, unless all are compelled to do so." S.Rep. 91-1282, p. 4 (1970), U.S.Code Cong. & Admin.News 1970, p. 5180, Leg.Hist. 144.

39 See, *e. g.*, 116 Cong.Rec. 38386 (1970), Leg.Hist. 1030-1031 (remarks of Cong. Dent):

> "Although I am very much disturbed over adding new costs to the operation of our production facilities because of the threats from abroad, I would say there is a greater concern and that must be for the production men who do the producing-the men who work in the service industries and the men and women in this country who daily go out and keep the economy moving and make it safe for all of us to live and to work and to be able to prosper in it."

40 See RTI, Cotton Dust: Technological Feasibility Assessment and Final Inflationary Impact Statement (1976), Ex. 6-76, Ct. of App.J.A. 457, 573-748; RTI, Technological Feasibility and Economic Impact of Regulations for Cotton Dust: Testimony to be Presented by the Research Triangle Institute at Public Hearing (1977), Ex. 16, *id.*, at 1320, 1351-1357. The industry estimates were presented by Hovan Hocutt and Arthur Thomas, employees of dust control equipment manufacturers. Statement of Hovan Hocutt, Senior Vice President, Engineering, Pneumafil Corp., Ex. 60, *id.*, at 2228-2247; Statement of Arthur Thomas, Senior Vice President, The Bahnson Co., Ex. 62, *id.*, at 2248-2257. OSHA referred collectively to these two statements as the Hocutt-Thomas estimate.

41 RTI estimated compliance costs of $984.4 million for yarn production (opening through spinning), Ex. 6-76, *id.*, at 473, and $127.7 million for yarn processing (winding through weaving/slashing) *id.*, at 600. In another part of its study, RTI estimated yarn production costs of $885.6 million. *Id.*, at 589. The explanation for this discrepancy is not readily apparent from the record, although it may be attributable to cost estimates for different years.

42 RTI made what it called a "conservative estimate" that "controls would be applied to all the production equipment in mills processing cotton and cotton-synthetic blends, even if part of their product is pure synthetic." *Id.*, at 585.

43 RTI's David LeSourd explained that RTI did not have data on the degree of compliance for the industry as a whole, but only for some specific mills. *Id.*, at 3637-3638. Therefore RTI merely assumed that industry-wide PEL's were at a 1,000 ug/m^3 total dust PEL. Ex. 6-76, *id.*, at 579-580. The record contains conflicting evidence on the actual level of control in the industry.

Some evidence suggests compliance by mills substantially better than the 1,000 ug/m^3 total dust level. See, *e. g.*, Ex. 47, *id.*, at 2037 (66% of Burlington Industries work areas at or below 500 ug/m^3, 28% below 200 ug/m^3); Ex. 78, *id.*, at 2387. One expert, commenting on another study, observed that "substantial proportions of the industry are, in fact, within compliance of [200 ug/m^3]." *Id.*, at 3637. Other evidence in the record suggests that some segments of the industry are not in compliance with the 1,000 ug/m^3 total dust PEL. See, *e. g., id.*, at 3939 (criticizing RTI assumption of compliance). In any event, OSHA found that the "actual level of controls in the cotton industry could not be determined" on the basis of data available to RTI at the time of its study. 43 Fed.Reg. 27370, col. 3 (1978).

44 OSHA's cost estimate included $543 million for engineering controls (the Hocutt-Thomas estimate), $7 million for monitoring, medical surveillance, and other provisions (the RTI estimate), $31.5 million for waste processing, and $75 million for seed processing, for a total of $656.5 million. *Id.*, at 27380, col. 1.

45 The Hocutt-Thomas study based its estimates on data obtained from a recent ATMI survey of cotton mills. Completed questionnaires from 353 mills, which processed 80% of the cotton bales in the United States, were returned. Ex. 60, Ct. of App.J.A. 2231.

46 The Hocutt-Thomas study included an allowance for existing compliance efforts, by subtracting from its total estimate the cost of all engineering controls purchased by the industry prior to February 11, 1977. *Id.*, at 2232, 2247. Whether this is a sufficient proxy for current industry compliance is not apparent from the record. Hocutt himself admitted that he did not have figures on what portion of the industry was meeting the 1,000 ug/m^3 total dust PEL. *Id.*, at 3941.

47 John Figh, a vice president at Chase Manhattan Bank specializing in the textile industry, commented on the trend toward modernizing equipment in the mills:

"[B]y *continuing* to upgrade plants with the most modern and efficient equipment, the textile manufacturing industry will likely not be required due to demand to add much in the way of new bricks and mortar. There may be some individual cases of out-of-date facilities being replaced by new buildings; but for the most part, I believe we will see *more* in the way of modernization of existing plants...." Ex. 63, *id.*, at 2260 (emphasis added).

One study explained why the costs of controls should be lower if a mill converts to new equipment as opposed to retrofitting old machines:

"1) The operating cost of new equipment with controls on that equipment is less than the operating cost of the old equipment with controls necessary for the older, slower equipment to meet proscribed [*sic*] dust levels; and 2) by going to newer equipment with controls there is a likelihood that increased production rates will result in recovery of some or all of the capital cost of control." Ex. 79A, *id.*, at 2532; see Ex. 79C, *id.*, at 2550-2551; Ex. 63, *id.*, at 2261; Ex. 78, *id.*, at 2376-2377.

48 Chase Manhattan Bank vice president Figh noted that "[t]here does not appear to be any vast new technology on the horizon," but that "[a]s for new machinery, evolutionary changes are continuing at what appears to me to be about the same rate as in the last few years." Ex. 63, *id.*, at 2260-2261. One study is particularly critical of the assumption of a "static state of technology," Ex. 78, *id.*, at 2380, and documents technological advances that can be expected, *id.*, at 2380-2386. Some experts were less optimistic of the role of technology. See, *e. g. id.*, at 3643-3644 (RTI study).

49 Hocutt-Thomas had some information on the "ratio of synthetics to cotton in blends" in the mills, but it is not clear from the record if and how they used this information. Ex. 60, *id.*, at 2230.

50 The final Cotton Dust Standard calls for PEL's of 200 ug/m^3 in opening through roving and spinning through warping, and 750 ug/m^3 for slashing and weaving. The Hocutt-Thomas study similarly assumed a 200 ug/m^3 PEL for opening through roving, but assumed less stringent PEL's of 500 ug/m^3 for spinning through warping, and 1,000 ug/m^3 for slashing and weaving.

51 For example, in questioning before an Administrative Law Judge, Hocutt answered:

"Well, I'm beginning to wish I hadn't said anything about this, which I did, and I have to be helpful. Practically all of this information that I have is confidential and I couldn't reveal any of the sources. You can only take my word for the figures. I can't substantiate it in any manner." *Id.*, at 3929.

Petitioners note, however, that the industry subsequently provided its survey data to OSHA, and that the only information deleted was confidential information withheld by agreement with the agency in order to prevent identification of specific mills. Reply Brief for Petitioners in No. 79-1429, p. 23, n. 32; see App. 388-390. OSHA responds that, "[b]ecause the number of machines was deleted and correlated dust data were not supplied, the data could not be used to support a specific cost adjustment." Brief for Federal Respondent 64, n. 70. In any event, no contention is made that OSHA had access to Hocutt's own data used to calculate his cost estimate.

52 Both petitioners and respondents attempt their own calculations from evidence in the record to show the unreasonableness or reasonableness of OSHA's rough equation between the Hocutt-Thomas overstatement in costs and the expense of achieving a standard somewhat more stringent for some operations. See, *e. g.*, Brief for Petitioner in No. 79-1583, pp. 9-10; Brief for Union Respondents 14-18. Such manipulation of the data suggests a wide margin of error for any estimate, whether it be OSHA's, the industry's, or the unions'. Viewed in that light, the agency's candor in confessing its own inability to achieve a more precise estimate should not precipitate a judicial review that nonetheless demands what the congressionally delegated "expert" says it cannot provide.

53 The Secretary originally asked RTI to prepare cost estimates for several PEL levels, including 500, 200, and 100 ug/m^3. Ex. 6-76, Ct. of App.J.A. 509. Clearly the Secretary intended to have cost information on the different PEL's that he might promulgate. Although RTI provided estimates for these levels in its final report, OSHA found them to be too unreliable to adopt as final estimates. See *supra*, at 2498.

> Even if the Secretary had wanted to obtain a cost estimate based on confidential industry data for the actual PEL's in the adopted Standard, he would have been unable to do so. Hocutt had concluded that it was technologically impractical to achieve PEL's below 500 ug/m^3 for the operations of spinning through warping, Ex. 60, Ct. of App.J.A. 2239-2241, and PEL's below 1,000 ug/m^3 for weaving and slashing, *id.*, at 2241-2243. Therefore, he declined to prepare cost estimates of a 200 ug/m^3 PEL for those operations. The Secretary obviously disagreed with his judgment of technological feasibility. We also note that, although petitioners challenged the technological feasibility of the final Cotton Dust Standard in the Court of Appeals, they have abandoned such challenge here. Brief for Petitioners in No. 79-1429, p. 8, n. 16.

54 The Court of Appeals observed that "the agency's underlying cost estimates are not free from imprecision," 199 U.S.App.D.C., at 80, 617 F.2d, at 662, but that "[t]he very nature of economic analysis frequently imposes practical limits on the precision which reasonably can be required of the agency," *id.*, at 79, 617 F.2d, at 661. We suspect that this results not only from the difficulty of obtaining accurate data, but also from the inherent crudeness of estimation tools. Of necessity both the RTI and Hocutt-Thomas studies had to rely on assumptions the truth or falsity of which could wreak havoc on the validity of their final numerical cost estimates. As the official charged by Congress with the promulgation of occupational safety and health standards that protect workers "to the extent feasible," the Secretary was obligated to subject such assumptions to careful scrutiny, and to decide how they might affect the correctness of the proffered estimates.

55 In one of their questions presented, petitioners ATMI et al. ask whether "the statutory requirement that compliance with an OSHA standard must be 'economically feasible' can be satisfied merely by the agency's conclusion that the standard will not put the affected industry out of business." Pet. for Cert. in No. 79-1429, p. 2. However, in argument in their brief petitioners appear to treat this issue primarily as a substantial evidence question. See Brief for Petitioners in No. 79-1429, pp. 24-31. They finally summarize their position as follows:

> "OSHA must present a responsible prediction, supported by substantial evidence, of what its standard will cost and what impact it will have on such factors as production, employment, competition, and prices. And the agency must explain in a cogent manner-on the basis of intelligible criteria-why it concludes that a standard having such an economic impact is 'feasible.' " *Id.*, at 35 (footnote omitted).
>
> As our review of OSHA's economic feasibility determination demonstrates, OSHA presented a "responsible prediction" of what its Standard would cost and its impact on "production, employment, competition, and prices." The agency concluded that its Standard is feasible because "compliance with [it] is well within the financial capability of the covered industries." 43 Fed.Reg. 27379, col. 3 (1978). OSHA also found that the industry "will be able to meet the demands for production of cotton products." *Id.*, at 27378, col. 2. We take these findings to mean, as the Secretary suggests, that "[a]t bottom, the Secretary must [and did] determine that the industry will maintain long-term profitability and competitiveness." Brief for Federal Respondent 49. See also *United Steelworkers of America v. Marshall*, 208 U.S.App.D.C. 60, 136, 647 F.2d 1189, 1265 (1981) ("the practical question is whether the standard threatens the competitive stability of an industry"); *Industrial Union Department v. Hodgson, supra*, 162 U.S.App.D.C., at 342, 499 F.2d, at 478. This interpretation by the Secretary is certainly consistent with the plain meaning of the word "feasible." See *Industrial Union Dept. v. American Petroleum Institute,* 448 U.S., at 717-718, n. 30, 100 S.Ct., at 2902, n. 30 (MARSHALL, J., dissenting). Therefore, these cases do not present, and we do not decide, the question whether a standard that threatens the long-term profitability and competitiveness of an industry is "feasible" within the meaning of § 6(b)(5) of the Act, 29 U.S.C. § 655(b)(5).

56 In contrast to the compliance cost estimates prepared by RTI, OSHA did not find any major flaws with RTI's study of the economic impact of compliance costs.

57 RTI specifically analyzed the impact of the Standard on the following areas in the cotton industry:

> "1) Additional employment requirements.

"2) Energy consumption.
"3) Increases in production costs and consequent price increases by affected industries.
"4) Capital requirements and capital financing problems.
"5) Competition effects on profit and market structure.
"6) Inflationary impact on consumers and U.S. economy.
"7) Employment impact due to the contraction of output demand."
Ex. 6-76, Ct. of App.J.A. 626.

RTI also examined the economic impact of two other across-the-board PEL's of 500 ug/m^3 and 100 ug/m^3. *Ibid.*

58 This cost estimate included $984.4 million for yarn production (opening through spinning), $1,387.9 billion for winding through weaving/slashing $292.2 million for cotton ginning, and $32 million for waste processing. *Id.*, at 737.

59 Cotton ginning was the subject of a separate regulation not at issue here. 43 Fed.Reg. 27350, col. 1 (1978); see 29 CFR § 1910.1046 (1980).

60 RTI's annual cost-of-compliance figure contained three components: an annualized capital charge, direct operating cost, and energy cost. Ex. 6-76, Ct. of App.J.A. 643. The annualized capital charge consisted of depreciation, interest, administrative overhead, property tax, and insurance. *Ibid.* Depreciation and interest were computed "by use of a capital recovery factor based upon the concept of capital rent, the value of which depends on the operating life of the equipment and the market interest rate." *Ibid.*

61 Petitioners' primary criticism of OSHA's reliance on the RTI study derives from their disagreement with RTI's assumption that compliance costs would be passed on to the consumers. Brief for Petitioners in No. 79-1429, pp. 28-29. This characterization misstates RTI's position. In calculating price increases necessary to maintain prestandard rates of return, RTI "decided to adopt an extreme assumption of zero price demand elasticity in computing post-control price increases" because of difficulties in obtaining data necessary to compute elasticities for cotton yarns. Ex. 6-76, Ct. of App.J.A. 657. However, RTI carefully tested this assumption to determine "how much bias" it would introduce into the analysis. *Id.*, at 657-659. RTI concluded that, "unless the true demand elasticity for the output of the given sector is substantially greater than unity, our impact analysis based on the assumption of zero price elasticity of demand would not be invalidated." *Id.*, at 659. Therefore, unless a 1% increase in price was met with substantially more than a 1% decrease in demand, RTI's estimates of the price increases necessary to maintain prestandard rates of return were valid. Since there was no evidence suggesting such an effect, RTI proceeded with its assumption.

In any event, RTI subsequently investigated short-term price elasticities of demand for 25 cotton consumer products, finding that 19 of them had elasticities less than or equal to unity. *Id.*, at 681.

62 RTI found higher price increases and lower rates of return when framing its analysis in pounds of cotton yarn produced. See *id.*, at 654, 729-730.

63 Petitioner National Cotton Council of America criticizes RTI's use of short-term price elasticity coefficients, claiming that this underestimates long-term demand responses to price increases. Brief for Petitioner in No. 79-1583, pp. 16-17. However, RTI's Dr. Lee, who conducted the elasticity analysis, observed that he used two independent procedures to compute demand contraction, and only one relied on short-term price elasticities. Ct. of App.J.A. 3626-3627. His "main procedure [was] input output table procedures," which produced an even smaller demand contraction estimate than those calculations relying on the short-term coefficients. *Ibid.*

64 RTI cited such nonprice factors as "research expenditures, promotion and advertising, fiber and fabric development, fiber properties, and care characteristics of fabric." Ex. 6-76, *id.*, at 623. John Figh, Chase Manhattan Bank vice president, observed that "polyester has grown at the expense of cotton over the last 10 years and I think it has penetrated most of the markets it can penetrate. ... [T]he majority of it, the growth of polyester at the expense of cotton, has been completed." App. 474-475. He noted that some cotton products, such as towels and 100%- cotton men's shirts, enjoy the support of consumer preferences. *Ibid.* Although RTI cited the energy crisis without detailing its possible impact on manmade fiber products, Ex. 6-76, Ct. of App.J.A. 948, OSHA observed that changes in petroleum prices, a key ingredient in synthetic products, may have important impacts on the competitive balance, see 43 Fed.Reg. 27370, col. 2 (1978).

65 Two of the six yarn production operations had ratios less than 1, two had ratios less than 2, and the remaining two were less than 6. Ex. 6-76, Ct. of App.J.A. 665. Chase Manhattan Bank's John Figh agreed with RTI's assessment that financing the $2.7 billion compliance cost for a 200 ug/m^3 PEL standard would be most difficult for smaller textile companies. Ex. 63, *id.*, at 2264-2265.

66 RTI conducted similar economic impact analyses, although in less depth, for the twisting through weaving and waste-processing sectors of the cotton industry covered by the proposed 200 ug/m^3 PEL standard. Ex. 6-76, *id.*, at 462. RTI found, for example, that price increases per dollar of industry sales ranged from 0.5 cents to 18 cents for twisting through weaving

operations, and that some of these operations would experience "severe" financing difficulties. *Id.*, at 733-734. To recount in further detail these conclusions would be an irrelevant exercise. RTI calculated that a 200 ug/m^3 standard for weaving/slashing would cost $1.259 billion, *id.*, at 600, and computed the economic impact based on that figure. But RTI had also estimated that compliance costs for a 500 ug/m^3 PEL would be zero. *Ibid.* Since the final Cotton Dust Standard sets a 750 ug/m^3 PEL for weaving/slashing, further review of RTI's conclusion with respect to its $1.259 billion cost is particularly unnecessary.

67 Petitioners note that, although RTI estimated that compliance with the Cotton Dust Standard would take eight or more years, OSHA required compliance within four years. Brief for Petitioners in No. 79-1429, p. 29. RTI chose an 8-year period primarily because of "problems the control industry may have in supplying the required equipment." App. 415; see *id.*, at 415-416. If this proves to be the case, then presumably individual mills will be able to obtain variances from the Standard's requirements because of technological infeasibility. See 29 CFR § 1910.1043(e)(1) (1980); 29 U.S.C. § 655(b).

68 Perhaps in light of this fact, neither petitioners ATMI et al. nor petitioner National Cotton Council of America frame their "economic impact" substantial evidence arguments based on OSHA's estimate of compliance costs. Instead, they adopt as a minimum RTI's $2.7 billion estimate for compliance costs with the proposed standard's 200 ug/m^3 PEL. Brief for Petitioner in No. 79-1583, pp. 15-16; Brief for Petitioners in No. 79-1429, p. 29.

69 The final Standard, 29 CFR § 1910.1043(f)(1) (1980), provides:

"Where the use of respirators is required under this section, the employer shall provide, at no cost to the employee, and assure the use of respirators which comply with the requirements of this paragraph (f). Respirators shall be used in the following circumstances:

"(i) During the time periods necessary to install or implement feasible engineering controls and work practice controls;

"(ii) During maintenance and repair activities in which engineering and work practice controls are not feasible;

"(iii) In work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the permissible exposure limit; and

"(iv) In operations specified under paragraph (g)(1);

"(v) Whenever an employee requests a respirator."

70 An employee may be unable to wear a respirator because of facial irritation, severe discomfort, or impaired breathing. 43 Fed.Reg. 27387, cols. 1 and 2 (1978).

71 The regulation, 29 CFR § 1910.1043(f)(2)(v) (1980) (emphasis added), provides:

> "Whenever a physician determines that an employee is unable to wear any form of respirator, including a power air purifying respirator, the employee shall be given the opportunity to transfer to another position which is available or which later becomes available having a dust level at or below the PEL. *The employer shall assure that an employee who is transferred due to an inability to wear a respirator suffers no loss of earnings or other employment rights or benefits as a result of the transfer*."

72 Although it cited no specific determination or statement of reasons proffered by the Secretary, the Court of Appeals was persuaded by this argument. 199 U.S.App.D.C., at 93, 617 F.2d, at 675.

73 There is evidence in the record that might support such a determination. Dr. Merchant testified that a medical surveillance program alone would not be sufficient for identifying and relocating employees suffering from byssinosis. App. 440-441. He observed:

"There is reluctance very often among the employee himself to leave his job. I think clearly some guarantees as to wages and opportunities must be an integral part of any recommendation to relocate somebody and it has been the experience in coal mining where miners are allowed, under the Coal Mine Health and Safety Act of 1968, to be transferred, a very low proportion of these men actually exercise their transfer rights." *Id.*, at 441.

However, the courts will not be expected to scrutinize the record to uncover and formulate a rationale explaining an action, when the agency in the first instance has failed to articulate such rationale. See *Automotive Parts & Accessories Assn. v. Boyd*, 132 U.S.App.D.C. 200, 208, 407 F.2d 330, 338 (1968).

74 In its specific discussion of the transfer/guarantee provision, occupying more than two-thirds of a page in the Federal Register, OSHA argued that "[i]t is manifestly unfair that employees who are unable to wear respirators suffer ... economic detriment because their employers have not yet achieved compliance with the engineering control requirements of the standard, but are relying instead on the interim and less effective device of respirators." 43 Fed.Reg. 27387, cols. 2 and 3 (1978). The agency then stated its judgment that the "protection [the transfer and guarantee regulation] affords should greatly increase the success of the standard's respiratory protection provisions." *Id.*, at 27387, col. 3. Since the Secretary had already presented an unauthorized reason for the guarantee provision, we decline to accept this "boilerplate" statement as a sufficient determination and statement of reasons within the meaning of the Act. 29 U.S.C. §§ 655(e), (f). See *Synthetic Organic Chemical Manufacturers*

Assn. v. Brennan, 503 F.2d 1155, 1157, 1160 (CA3 1974), cert. denied, 420 U.S. 973, 95 S.Ct. 1396, 43 L.Ed.2d 653 (1975); *Industrial Union Dept. v. Hodgson, supra*, 162 U.S.App.D.C., at 339-340, 499 F.2d, at 475-476; *Associated Industries of New York State, Inc. v. U. S. Dept. of Labor*, 487 F.2d 342, 354 (CA2 1973); *Dry Color Manufacturers' Assn. v. Department of Labor*, 486 F.2d 98, 105-106 (CA3 1973). See also Berger & Riskin, Economic and Technological Feasibility in Regulating Toxic Substances Under the Occupational Safety and Health Act, 7 Ecology L.Q. 285, 298-299 (1978).

75 Even had Justice REHNQUIST correctly characterized the Court's opinion, *post*, at 2508-and there were three possible constructions of the phrase "to the extent feasible"-this would hardly have been grounds for invalidating § 6(b)(5) under the delegation doctrine. After all, this would not be the first time that more than one interpretation of a statute had been argued. See, *e. g., Pennhurst State School v. Halderman*, 451 U.S. 1, 101 S.Ct. 1531, 67 L.Ed.2d 694 (1981); *Watt v. Alaska*, 451 U.S. 259, 101 S.Ct. 1673, 68 L.Ed.2d 80 (1981).

* Contrary to the suggestion of the Court, *ante*, at 2506, n. 75, I do *not* argue that the existence of several plausible interpretations of the statute is a ground for invoking the delegation doctrine: I invoke the delegation doctrine because Congress failed to *choose* among those plausible interpretations.

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